



## 33-MHz 386: Round 2

InfoWorld evaluates nine PCs based on Intel's most powerful 80386 chip.

See Page 71

MAY 27, 1991

FOR POWER BUYERS OF PC AND NETWORKING PRODUCTS

VOLUME 13, ISSUE 21

## IBM Readies 'One-Stop' Shopping for Multimedia

Upgrade Kits, OS/2 Extensions Due in 1991

By Nico Krohn

ATLANTA — IBM Corp. expects to release a slew of multimedia products this year — including extensions to OS/2 — as part of its plan to establish itself as a one-stop shop for corporate multimedia buyers.

The new products will include two upgrade kits that turn PS/2s into multimedia machines, a video digitizing board, a 3½-inch read/write optical drive, and a voice recognition system codeveloped with Dragon Systems Inc. of Newton, Massachusetts.

IBM's multimedia product plans go beyond the hardware

and software described by officials last week at Comdex. They outlined a plan to offer developers, as well as users, a one-stop multimedia solution. In contrast, Microsoft has offered the industry little more than a specification for multimedia systems.

"Applications developers must have access to all [authoring] tools from one source," said Michael Braun, vice president of multimedia for IBM Corp. speaking at Comdex.

IBM will also distribute products developed by third parties, said Peter Blakeney, IBM's manager of market programs.

IBM expects to ship this year



IBM's Michael Braun said authoring tools should be provided by one source.

two upgrade kits that will turn ordinary PS/2s into what IBM officials call a Training System and an Information Delivery System, Braun said.

The Training System is a 386-based PS/2 that supports

See Multimedia, Page 113

## Microsoft Porting Tools For Windows Spear PM

Move Is Made to Bury Presentation Manager

By Stuart J. Johnston  
And Scott Mace

ATLANTA — Microsoft pounded another stake through OS/2 Presentation Manager's heart last week when the company disclosed it will deliver tools to port Presentation Manager code to Windows.

The Redmond, Washington-based company said it is working on tools to help ISVs, resellers, and systems integrators move PM products and applications to Windows.

This effort supports Microsoft's plans for a 32-bit version of the Windows program interface that will run alongside PM

on top of OS/2 3.0's New Technology (NT) kernel. This interface, Win-32, will also run on top of DOS.

Microsoft is encouraging developers to abandon PM, observers said, by providing advanced applications under Windows that are available only on OS/2, and expanding the Windows application programming interface (API) to support 32-bit operations.

Chris Mortenson, managing director at Alex. Brown and Sons, in New York, saw other motivations for the new tools.

"Microsoft told everybody that PM was the future," Mortenson said.

See Microsoft, Page 113

## IBM Pumps Up OS/2 With 286 Trade-In Plan

By Ed Scannell  
And Tuseda Graggis

IBM is offering a trade-in and financing program to several large accounts for replacing 80286 PS/2s and ATs with IBM 80386-based units.

The move allows IBM to pump more OS/2 2.0-compatible

machines into the market and gives Big Blue a way of controlling competition from low-end clone makers, said some observers.

"We are responding to several customer requests for IBM's assistance in upgrading their older 286-based systems to newer 386-based systems," said

Joe Guglielmi, vice president and general manager of marketing business development for IBM's personal systems business.

Guglielmi is reviewing these user requests and examining a number of alternatives "that may or may not evolve into a widespread offering," he said.

Under the current proposal, buyers can finance massive 80386 upgrades through the

See IBM, Page 113

## IBM Shows Off DR DOS Under OS/2

IBM demonstrated for the first time publicly last week OS/2 2.0 running Digital Research Inc.'s DR DOS 5.0 to show off OS/2 2.0's virtual machine capabilities.

"We wanted to show that OS/2 2.0 enables you to not only run an optimized version of DOS, but to boot any other type of DOS including 3.3, 4.0, 5.0 and now DR DOS 5.0," said John Soyring, IBM's director of software development support for personal systems.

Under OS/2 2.0 users can simultaneously boot multiple applications that take advantage of multiple versions of DOS.

See OS/2, Page 113

## Street Prices Continue to Drop

Month	386 SX	386	486
October 1990	\$2,276	\$6,860	\$7,457
November 1990	\$2,411	\$4,524	\$7,641
December 1990	\$2,285	\$4,117	\$7,213
January 1991	\$2,364	\$4,208	\$7,136
February 1991	\$2,347	\$4,081	\$7,348
March 1991	\$2,200	\$3,740	\$6,776

NOTE: FIGURES ARE AVERAGES FOR SELECT VENDORS AND MODELS

SOURCE: IDC

With pricing for IBM compatibles continuing to decline, IBM is working on ways to make its systems attractive to corporations.

## THIS WEEK



### HARD-COPY COLOR.

The quality of desktop color printing is rising almost as fast as the price of color printers is dropping. See Perspectives, Page 56.

### MORE CONTROL.

Harvard Graphics 3.0 gives users greater control over objects and powerful charting features. See First Look, Page 86.

## Apple Plans RISC-Based System for 1992 Release

By Kristi Coale

Apple Computer Inc. will expand its product line beyond the Macintosh by mid-1992, when the company plans to roll out its "Pink" RISC-based line with an entirely new operating system.

The Pink project fulfills the promise Apple Chairman and CEO John Sculley made last fall that Apple would introduce a high-end computer that would not be a Mac.

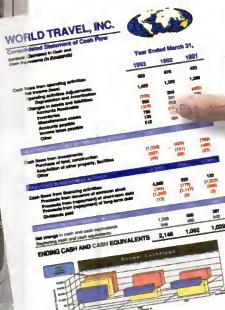
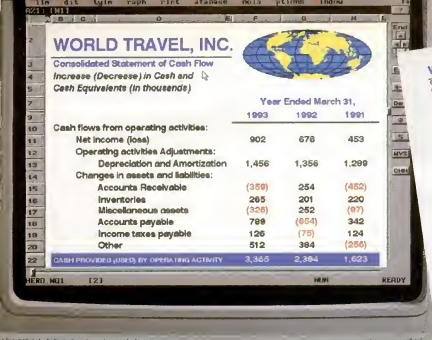
"The Macintosh hardware has seen little innovation since the Mac II [in 1987]," said one

developer. "Apple needs to go to something beyond the Mac to survive."

Sources familiar with the Pink project say Apple has narrowed its choices for RISC processors — the heart of the Pink line — to the Motorola 88110 and the MIPS R4000.

Apple's move to a RISC-based machine will require a new operating system because the processor architectures are so different from the existing CISC-based Macintosh, said Michael Slater, editor of The Microprocessor Report, in

See Apple, Page 113



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## Quattro Pro 3.0 beats 1-2-3. Again.

Feature	Quattro Pro	1-2-3 r3.1	1-2-3 r2.2
"Live" editable WYSIWYG spreadsheet	Yes	Yes	No
WYSIWYG page preview	Yes	No	No
Banner (sideways-oriented) printing	Yes	No	No
Print-To-Fit* automatically on a page	Yes	Yes	No
Backsolver technology built in	Yes	No	No
3-D graphs (ribbon, step, bar, area, pie)	Yes	No	No
Worksheet zoom	Yes	Yes	No
Draw package built in	Yes	Yes	No
Clip art library	Yes	No	No

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CODEME80

Circle 10 on Reader Service Card



Lotus' Freelance Graphics for Windows gives users multiple views simultaneously. **18**



NoteBook Computer offers 20-MHz 486SX or 33-MHz 486DX CPUs. **23**



Claris' Resolve offers MacDraw-like tools, charting capabilities, and 32-bit color. **44**

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Apple launches Operation PC to win users over to the Mac. **8**

Microsoft's Visual Basic allows users to write Windows programs without using C. **6**

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Multimedia publishers fear Microsoft's move into CD ROM publication market. **6**

Gupta ships a SQLWindows connectivity package for SQL Server. **6**

HP releases LM/X 1.1, and contracts with Microsoft to support LAN Manager for OS/2. **6**

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## AT DEADLINE

# Intel Ready i860 Chip With Cache Controller

Intel plans to announce on June 5 the latest member of its i860 microprocessor family. It features a cache controller, which ensures that caches in multiple processing systems do not store different versions of the same information, says Michael Slater, editor of *The Microprocessor Report*. The chip, which will also work with Intel's 486 microprocessors, will be especially attractive to multiprocessor systems manufacturers, Slater said. Intel declined to comment.

— Louise Fickel

## Apple Plans Layoff of 2,000 Workers

Sources close to Apple Computer Inc. indicated the company is readying a plan that could lay off as many as 2,000 of Apple's approximately 15,000 employees. Although Apple's unit sales have greatly increased following the introduction of low-cost systems in October, the smaller profits of those systems have forced Apple to start looking for ways to cut costs. An Apple spokesman declined to comment on the possibility of layoffs in the near term, but reiterated Apple chairman John Sculley's earlier comments that the company was aware of its declining earnings and would cut operating expenses.

— Tom Quinlan

## Microsoft to Ship CodeView Bug Fix

Microsoft is shipping an update to its CodeView 3.1 debugger that fixes a bug that may cause data loss for users of either its C 6.0 Optimizing Compiler or Basic Professional Development System, Version 7.1, the company said last week. CodeView 3.14 fixes problems caused by a rare interaction between CodeView 3.10, third-party, high-memory drivers, HIMEM.SYS, and "a future version of DOS," the company said.

Registered users will receive the fix by mail; others can call Microsoft Product Support Services at (206) 637-7096.

— Stuart J. Johnston

## WordPerfect Windows Slips to Fall

WordPerfect Corp. users planning to move to Windows will have to wait until the third quarter to try out the company's graphical word processor. The Orem, Utah-based company plans to announce today that WordPerfect for Windows — most recently slated to ship in June — has just entered the internal alpha testing stage. In one to two months, a beta version will be available to customers subscribing to the Software Subscription Service, which can be reached at (800) 321-4566, Ext. 2-2685. "If all goes well, we should release the [final] product in August," said Pete Peterson, executive vice president.

— Elizabeth Eva

## Cumulus to Unveil 486-Based PCs

Cumulus Corp. will announce three 486-based systems at this week's Comdex show, each with Windows 3.0 and Microsoft Works pre-installed on the hard disk. The systems will be available in slimline, desktop, and tower configurations, with chip speeds of 25 or 33 MHz.

— Ed Scannell

## U.S. Robotics Acquires Touchbase

Modem maker U.S. Robotics Inc. last week acquired Touchbase Systems Inc., maker of the WorldPort pocket modem and a portable V.32 high-speed modem. Touchbase cofounders Christopher Coffin and Michael Bernard will become vice presidents of U.S. Robotics. Terms of the deal were not disclosed.

— David Coursey

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CRT/Get Pixels:	14"/0.28	14"/0.28	14"/0.28
H. Frequency:	31.5 KHZ 35.5 KHZ 35.5 KHZ	31.5 KHZ 35.5 KHZ 35.5 KHZ	31.5 KHZ 35.5 KHZ 48 KHZ
V. Frequency:	43.5 HZ 60/70 HZ	43.5 HZ 60/70 HZ	72 HZ 60/70 HZ
Resolution in Pixels:	1,024 × 768	1,024 × 768	1,024 × 768
Compatibility:	IBM 8514/A APPLE MAC II	IBM 8514/A	IBM XGA (FLICKER FREE)

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## NEWS

## Apple Eyes DOS Market With System 7 Release

Stresses Workgroup Features Over Windows

BY KRISTI COALE

Armed with a plan called Operation PC, Apple Computer Inc. hopes its System 7 will nip in the bud the momentum of Windows 3.0.

Apple is making an all-out effort to increase the Macintosh's market share, said Apple chairman and CEO John Sculley. Last week's System 7 rollout is the culmination of a campaign that began last fall with the introduction of low-cost Macs and includes recent price cuts.

"A big part of Operation PC is increasing Apple's awareness

among this other community of users," said Mike Homer, Apple's vice president of marketing.

Under Operation PC, Apple will provide its dealers with comparative data from updated studies of differences between Windows and the Macintosh.

The company also plans to broaden its support offerings through joint technical support deals with such firms as Novell.

Strategically, Apple hopes to attract current DOS users to System 7 with its workgroup features. These workgroup-oriented capabilities may give Sys-



John Sculley said System 7 is part of an all-out effort to increase the Mac's user base.

tem 7 a slight edge over Windows, which currently has little network support.

For example, System 7's aliases feature will let users leverage their investment in desktop computers — allowing them to transfer files to laptops and notebooks easily, Sculley

See System 7, Page 8

## IBM Blesses Borland C++ As OS/2 2.0 OOP Tool

Heads Off Microsoft Attempt to Dominate

BY STUART J. JOHNSON  
AND ED SCANNELL

IBM and Borland International Inc. have teamed up to establish an object-oriented language standard for OS/2 2.0.

Last week, IBM endorsed Borland's C++ development environment for OS/2 2.0 — pre-empting recent Microsoft moves to dominate the object-oriented programming (OOP) languages area.

Under an agreement between the companies, Borland will ship beta versions of its C++ 2.0 compiler for OS/2 2.0 by year end; commercial shipments are due the first half of next year.

"We took a look at the tools in the industry and concluded Borland has the leading C++ technology," said John Soyring, IBM's director of software development programs.

IBM also sees Borland's C++ as a "key technology" for the success of its Patriot Partners project with Metaphor Computer Systems, Soyring said.

The announcement heightens the tug of war between Microsoft and IBM over the future of users' desktops. At the same time, it helps to strengthen Borland's position as the leader in OOP languages.

"It certainly helps me PM [Presentation Manager] along [and it] solidifies Borland's C++ against the Microsoft vapors," said Jeffrey Tarter, editor of the industry newsletter, *Soft Letter*, in Cambridge, Massachusetts.

This agreement occurs just as the corporate marketplace is

beginning to shift away from the DOS world and C as a language standard, and toward graphical user interfaces (GUIs) and OOP tools. A recent report by Forrester Research Inc. found that half of the Fortune 1000 companies surveyed had a general knowledge of OOP.

OOP is seen by most developers, including Microsoft and Patriot Partners, as essential for simplifying GUI application development in the 1990s.

Although sales of OS/2 applications have yet to pick up vis-à-vis Windows, Microsoft has been losing market share in languages to last year's Turbo C++ and this year's C++ 2.0. Borland claims to have sold more than 350,000 copies of its C++ products.

Microsoft has promised to ship a DOS version of its long-delayed C++ compiler this year, but did not say when it will deliver a Windows or OS/2 version.

"On IBM's part, this is a pretty smart move [and] for Borland it is probably a rub-your-nose-in-it-kind-of move," said Will Fastie, editor of *The Fastie Report*, in Baltimore.

The companies made no prior announcement, nor did they comment on whether IBM will repackaging Borland C++ 2.0 in the way that it already has done with Microsoft C.

Borland is also developing a version of its ObjectVision class libraries for OS/2 that will ease writing PM applications for developers, said Gene Wang, Borland languages vice president.

## Microsoft Visual Basic Promises 'C' Relief

BY STUART J. JOHNSON

ATLANTA — Microsoft Corp. will offer a hand up to users who want to write their own Windows programs without struggling with the complexities of C programming when it formally introduces Visual Basic today.

Visual Basic, which will ship in June and costs \$199, lets users create Windows programs using a subset of Quick Basic and a screen painter tool. The product is being introduced at Windows World, which opens here today.

The package — which was code-named Thunder — is designed to appeal to users who have some technical abilities, but they need not necessarily be sophisticated programmers, said Tom Button, Microsoft product marketing manager for applications programmability. "If you can program at all, you can use Thunder," he said.

Button and several beta

testers discounted criticisms that a tool for the masses would not be suitable for serious programmers.

"I guess [critics] are expecting too much," said John McComb, a senior programmer and analyst with Continental Healthcare Systems, in Libertyville, Illinois. "It's exactly what I wanted in a prototyping tool."

Visual Basic to prototype an internal customer database, he may choose to write the final code in Borland C++ 2.0.

Microsoft's applications group is looking at using Visual Basic to write some commercial products, Button said.

The capability to write custom Windows controls in C for Visual Basic will open up a market for ISVs to write add-ons for the system, said Neve Basker, product manager for Visual Basic. Custom controls can range from small features, such

as sliders or grids, to spreadsheets, text and chart editors, and communications and SQL Server access facilities, she said.

At least 25 ISVs intend to develop custom controls for Visual Basic, Basker added. A custom control developer's kit will cost \$49.95.

Besides the development environment, the package will include a clip art library with more than 400 Windows icons and three sample applications — one of which is an icon editor, she said.

Object Linking and Embedding (OLE) technology will not be included in the original release, but Microsoft is working on libraries to support it. The Multimedia Extensions for Windows 3.0 will also be supported in the future, officials said.

## Citizen to Unveil Lightweight, Laser-Quality Printer

BY MARTIN MARSHALL

Using a new printing technology, Citizen America Corp. has created a laser-quality, 2-pound printer that it will announce this week at Spring Comdex.

The printer, the PN-48, uses cut-sheet plain paper. It is 11.7 inches by 3 1/2 inches by 2 inches, and one battery change is good for printing about 25 pages. Printing a single page of text takes about 1 minute, while a graphics page takes about 4 minutes, said David Ball, product manager for the PN-48.

At a \$549 list price for the printer, battery, AC adapter, and ribbon, the PN-48 will compete with ink-jet portable printers such as the Canon

Bubblejet. Its competitive advantage is the quality of its printout.

"We had a double-blind study, and there was a slight preference for PN-48 output over that of an HP Laserjet IIP," Ball said. "In the second tier were the Canon Bubblejet, and in the third tier were the Kodak Diconix 150 ink-jet and our 9-wire dot-matrix printers."

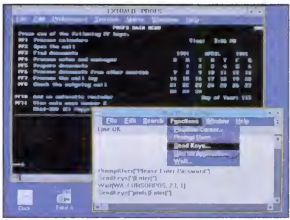
The quality of the PN-48 output comes from the hard bonding of a tonerlike chemical onto the paper, in a process similar to the third step used in laser printing, Ball said.

The Citizen printer does not do the first two steps in laser paper printing — photosensitizing the drum and electrostatic

deposition of loose toner onto the paper. Instead, it uses a ribbon carrying a tonerlike chemical that bonds with the paper. "This gives it a real laserlike hard bonding. There is no water solubility problem like there is with ink-jets," Ball said.

Citizen calls its new technology thermal fusion, Ball said. Although it is a nonimpact technology, the ribbons will come in single-strike (25 pages) and multistrike (70 pages) versions reminiscent of IBM typewriter ribbons. A five-strike ribbon will cost \$24.95 for either version.

Citizen America Corp., 2450 Broadway, Suite 600, Santa Monica, CA 90401-4000.



Visual Basic will let users create application interfaces simply by drawing them on-screen, using the supplied drawing tools.

# CD ROM Publishers Fear Microsoft Will Corner Multimedia Market

By NICO KROHN

Microsoft Corp.'s aggressive move into publishing multimedia CD ROMs has spooked some developers, who fear they will be squeezed out of multimedia publishing.

The Redmond, Washington-based software giant recently purchased the electronic rights to British book publisher

Dorling Kindersley Ltd.'s 600 titles.

Peter Black, president of multimedia publisher Xiphias, said he has killed plans to develop titles for Microsoft's multimedia PC platform. He fears that Microsoft will announce titles meant to compete directly with his.

Laura Buddine, president of Tiger Media Inc., said Microsoft for a time might strike against her small Los

Angeles, firm at a recent CD ROM conference.

At the conference Microsoft announced its acquisition of Dorling, tout-ing it as the publisher of *The Way Things Work*. The same day, Tiger Media announced *How Things Work*, a multimedia application that cost Tiger Media \$700,000 to create.

"Three people came to our booth and

said, 'Is this what Microsoft just announced?' " Buddine said.

Microsoft wants to encourage developers to continue title development for multimedia PCs, although it is planning to move aggressively into title — as well as multimedia operating system — development, said Darby Williams, group product manager in Microsoft's multimedia systems division.

Although some developers, including Tiger Media, say they aren't ready to drop plans to develop for the multimedia PC platform, most say they will develop for other platforms as well.

"It's a two-edged sword," said Stephen Buerkle, director of business development for Applied Optical Media Corp., in Malvern, Pennsylvania. "If they [Microsoft] keep buying up all the intellectual properties and picking all the cherries, then I think there's a problem. On the positive side, the platform desperately needs titles."

"If the disincentive is strong enough it could kill off the platform," according to Xiphias's Black.

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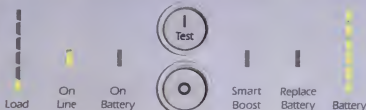
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## Gupta Ships Tool to Connect SQLWindows, SQL Server Databases

By YVONNE LEE

Gupta Technologies Inc. last week began shipping a connectivity application package that allows SQLWindows front ends to access data on Microsoft SQL Server databases.

The \$1,995 SQLWindows for SQL Server Client-Server System includes the SQLWindows: application development tool, five run-time versions of SQLWindows, and SQL/Routers for SQL Server.

The package allows developers to create Windows applications for SQL Server. The company also has SQLWindows packages for its own SQLBase Server, IBM's DB2, and Oracle Server.

The system competes with SQL Server Library for SQL Windows, from Automated Design Systems Inc. of Atlanta.

SQL Windows for SQL Server also works with the Sybase SQL Server. Gupta is co-marketing the system with Microsoft and Sybase.

Because SQL Windows for SQL Server Client-Server System uses Gupta's SQL/Router, it enables developers to easily build scrolling applications, according to Rod Zimmerman, Gupta's market development manager.

"It makes scrolling run faster, and more people [can] scroll at the same time without locking each other up," Zimmerman said. This forward and backward scrolling could be built without the SQL/Router's front-end results set feature, but it would take much more time, he added.

Microsoft and Gupta are finalizing an arrangement to bundle the SQLWindows for SQL Server Client-Server System with SQL Server.

"Microsoft and Gupta are working together with the resellers on that," said Cindy McHenry, a Microsoft spokeswoman. "They are still negotiating all the final details with the distributors." Details on the bundle should be available this week, she said.

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Std. plotter emulation	✓ Yes	No
Font card slots	✓ 2	1
Std. input paper tray capacity	✓ 200	50
Std. output paper tray capacity	✓ 100	50
Opt. sec. input paper tray capacity	✓ 500	250
Opt. envelope tray capacity	✓ 75	20

## First Look

Continued From Page 1

program, with menus such as File (including printing), Edit, and Help. But when you type the familiar slash key, a "1-2-3 Classic" menu appears as a window on top of your worksheet. Now you can enter commands exactly as you would in Release 3.1 or 2.3. If you hit the colon key, this menu even brings up the worksheet formatting commands from the WYSIWYG add-in included with those packages. In short, if you know 1-2-3, you can immediately begin to work with 1-2-3 for Windows using the Classic menu.

I suspect that most users will migrate to the newer menu system and icon palette, but the Classic menu certainly speeds learning and means that the program can run your older 1-2-3 macros without modification.

Also, the program reads in,

saves, and translates the FMT format used by WYSIWYG. When you move across files with formatting, 1-2-3 for Windows will map the fonts to the closest equivalent in Adobe Type Manager. (Reports indicate that Lotus will bundle ATM with this release.)

1-2-3 for Windows includes an icon palette that you can fix at the top, left, bottom, or right of the screen. You can also let it "float," to move it and resize it. The basic icon bar changes when you switch to the graphics window, when you work with and annotate your charts. In addition, you can customize the icon bar, adding your own icons for such things as macros or add-ins. Lotus also plans to provide "smart icons" that support such capabilities as automatically adding a range, sorting, or formatting a table.

Unlike other versions of 1-2-3, this version uses ATM-scale fonts and lets you quickly zoom the active spreadsheet to

various sizes. You may specify the font, size, borders (including drop shadows), color shading, alignment, and numeric format for a range of cells. When you store this information as a named style, you can easily apply it to other ranges. However, you can have only eight active fonts and sizes, although you can easily select which fonts you want from the main list in Windows.

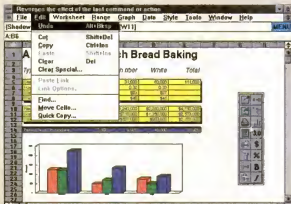
A draft view turns off the display of all the formatting and is much faster than other windows, which you can use to enter graphs for entering data.

The program has basic graphics capabilities, including High-Low-Close charts, and 3-D line, area, bar, and pie charts. You can enhance these graphs with basic drawing tools, change various colors and fonts, and insert these graphs into your spreadsheet. However, I wish it were easier to rename the graphs or to resize them once they are inserted.

Lotus has paid a lot of attention to little things that make the program easier to use, particularly for people who are used to 1-2-3. You can cut and copy ranges as in most Windows applications or simply choose the traditional 1-2-3 functions.

All in all, 1-2-3 for Windows has a lot going for it. Current 1-2-3 users will get direct compatibility with existing files, keystrokes, and macros, along with full Windows support. The pre-release version still has a few rough edges, and we won't really be able to get a good handle on its speed until it gets closer to being finished. But it certainly feels like a credible competitor.

Lotus Development Corp., 55 Cambridge Parkway, Cambridge, MA 02142; (617) 577-8500.



1-2-3 for Windows easily inserts graphs into worksheets; you can use drawing tools to annotate graphs, and change colors or fonts.

## Lotus to Put Its Windows Foot Forward

By BARBARA DARROW

ATLANTA — Lotus Development Corp. hopes to prove its Windows worthiness here this week by showing several in-process applications, including 1-2-3 for Windows.

The company will also announce plans at Windows World to ship its new Type Manager (ATM) for Windows with all upcoming Windows applications, sources said. ATM is already bundled with other packages, including Aldus PageMaker 4.0 for Windows, to compensate for Windows font limitations.

Lotus 1-2-3/W, which entered widespread beta testing two weeks ago, flaunts a floating icon palette, a variant of icons that users can click on to get to common commands. The customizable, movable palette is similar to those offered in Ami Pro and the upcoming Freelance Graphics for Win-

dows product, which will also be on display.

As promised, the package also offers a choice of the "Windows" or "Classic" 1-2-3 interfaces. Users who want to retain the DOS version's familiar keystroke commands can choose the latter by hitting the slash key.

The Classic menu looks just like 1-2-3. If you have WYSIWYG attached, you can still call that menu by hitting the colon key. But the Windows pull-down menu also has a lot of the WYSIWYG features included, "said one beta tester.

Beta-tester reaction was generally positive. One user running the package on a 386 with 8 megabytes of memory cites good performance and fast screen refreshes. Another, however, working on a 386 with the minimum requirement of two megabytes of RAM, had difficulty opening files.

"I can run only in standard

mode, but I've got [1 megabyte] free — which the package requires — but it won't open my files [and] tells me that they don't exist," he said. "I get lots of Unrecoverable Application Error messages, probably because of memory limitations."

Others said such messages are attributable more to Windows itself than to the specific application. "Typically, a UAE message happens when you don't have enough hard disk space left to store all the temp files that Windows makes when it crashes. If you use Windows, you've got to run 'check disk' slash S to a lot to find all those lost chains," said Jack McGrath, a spreadsheet consultant.

The promised Object Linking and Embedding (OLE) technology may be included in the code beta testers are using.

The product is due to ship this summer.

— Ed Scannell contributed to this story.

## HP Alters LAN Manager Course in Midstream

By JODI MARDERICH

Hewlett-Packard Co. realigned its LAN Manager strategy last week with two announcements: It will no longer sell LAN Manager for OS/2 beyond the current version, and it has ended its development partnership with Microsoft Corp. on LAN Manager for Unix (LM/X).

Instead the company will release Version 1.1 of LM/X (see sidebar) in August, and it has signed on with Microsoft to provide service and support to LAN Manager users.

"HP is putting their strategy into focus," said Craig Burton, CEO of Clarke Burton Corp., in Salt Lake City. "They were unsure of what their role is, and they now have a much clearer picture: They are a service provider and integrator rather than an innovator of LAN technology."

"We're trying to integrate LAN Manager and Novell PCs into our enterprise-wide solution," said Dan Sherwood, product marketing manager at HP's Colorado networks divi-

sion, in Fort Collins, Colorado. "We're trying to make sure if our customers buy either, they can gain access to our servers and all HP computers."

HP LAN Manager, Version 1.1, which began shipping in March, is the last version of the product HP will sell to users. But it will continue to support customers who have the product, said Roger Costa, general manager for the product support division, in Mountain View, California.

Part of HP's decision to stop selling LAN Manager is based on Microsoft's decision to provide a TCP/IP transport as part of LAN Manager, Sherwood said. The software is due in the second half of this year, he said.

Microsoft will make an upgrade kit available for HP LAN Manager 1.0 or 1.1 users who want to upgrade to Microsoft LAN Manager in the second half of this year, Sherwood said.

In its efforts to service and support LAN Manager for OS/2 users, HP will install a modem, and software that allow them to remotely monitor user sites.

## HP Pushes Ahead With Updated LM/X

Hewlett-Packard isn't waiting for LAN Manager for Unix 2.0 from Microsoft to continue on with its Unix LAN Manager plans. LM/X, Version 1.1 will support Windows and MS-DOS 5.0, as well as new administrative functions.

It will also be tuned to run on HP's new RISC boxes, including the 700 Series that will ship in July, said Dan Sherwood, product marketing manager at HP's Colorado networks division.

LM/X 1.1 has a beefed-up administrative system using Motif and X Windows, Sherwood said. "You can have a window on-screen for every server on the network and can manage all the LAN Manager servers through the X Windows interface."

The new release, scheduled to ship in August, is also easier to install and use, Sherwood said. It includes bug fixes and will work with HP-UX 8.0, which is due to ship this month.

— Jodi Marderich

## System 7

Continued From Page 5

said. Aldines generate 2K files containing information about all the contents of a hard disk drive. Users can take a floppy disk of aliases to another system, and when connected to their original system via a network, directly access the files on the hard drive.

System 7 has also enhanced file sharing capabilities — the infrastructure for what Sculley sees as the future direction of computing collaboration.

While System 7 is an important foundation for furthering the Mac, by itself, it will not sell Macs. Third-party applications will do this. Sculley admitted that it was in new applications

development that Windows 3.0 had had its real effect on Apple.

"System 7.0 will provide developers with many new opportunities, and we are confident that product innovation will return to the Mac," he said. For all networking enhancements, however, corporations may be a tough battle for Apple.

"System 7 is really nice, and it does everything Windows can do, only faster," said Skip McDowell, senior manager of systems analyst with Georgia Power Corp., in Atlanta. Networking features in System 7 also make the Mac more attractive than ever before.

However, because the utility is predominantly a PC house, Apple will have to improve its networking capabilities further before it makes any inroads into the PC base, he said.





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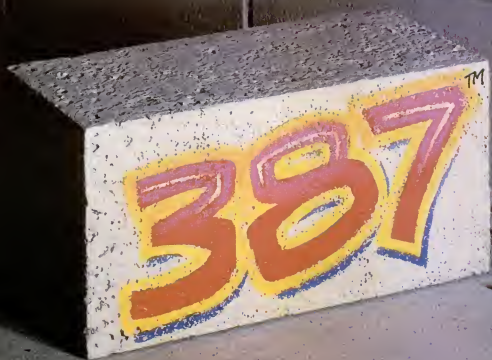


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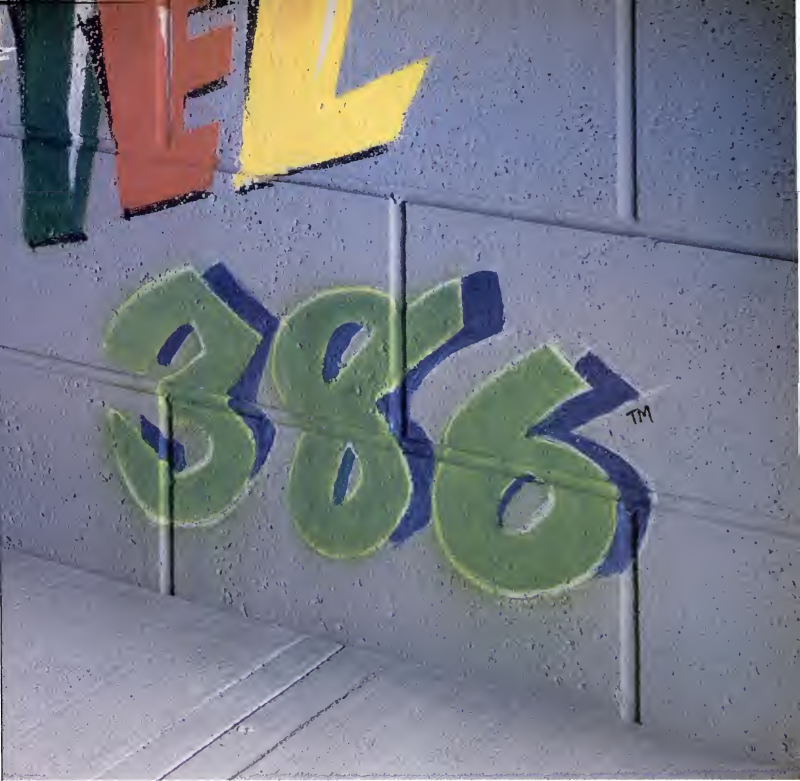
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## Zenith Introduces Power-Saving Portable PCs

By TUESDA A. GRAGGS

Zenith Data Systems will announce today five portable PCs, including one that promises users "months" of battery life.

The systems include a power-conserving 386SL-based notebook that has a 486 laptop, a 486SX laptop, but no on/off switch.

The 386SL chip set allows



Zenith hopes to break out in front of the hordes of portable manufacturers with the power-efficient MastersPort 386SL.

### COMDEX '91

the MastersPort 20-MHz notebook to run on battery power for up to 8 hours under normal "rest-resume" working conditions. It can maintain memory for as long as 30 days when not in use.

The 386SL comes with a 60-megabyte rest-awake hard drive; a 1.44-megabyte 3½-inch internal floppy drive; two serial, parallel, video, modem, and external floppy drive ports. The 12.4-by-8.3-by-1.8-inch unit sells for \$4,999, including Windows 3.0 and DOS 4.01. It is set to ship in June.

Under normal conditions the

SL-equipped system will run much like its 386SX cousins, Zenith said. The special power management features—such as a rest function that keeps programs in memory without using significant power until a user either plugs the machine in or changes the battery—make it a more useful tool for those who use a laptop constantly.

The system also comes with 2 megabytes of RAM, 128K of upgradable flash memory, and a black-and-white supertwist VGA-compatible LCD screen.

Zenith will also introduce the SuperPort 486 and SuperPort 486SX laptops. They offer

about 3 hours of battery life and are slated to ship in the fall.

Both machines weigh 15 pounds; have 120-megabyte hard drives; 10.7-inch VGA displays; detachable keyboards; 4 megabytes of memory, expandable to 16 megabytes; and isopoint pointing devices. They are encased in 12.1-by-15.1-by-3.1-inch magnesium cabinets.

The 25-MHz 486 laptop machine has a list price of \$8,899, and the 80486SX-based machine is priced at \$7,499.

Zenith Data Systems, 2150 E. Lake Cook Road, Buffalo Grove, IL 60089; (800) 553-0331.

## SPC Purchases Windows Database Publisher

By LISA PICARILLE

Opening its Windows checkbook once again, Mountain View, California-based Software Publishing Corp. last week announced it has signed a letter of intent to purchase Superbase publisher Precision Software Ltd. for \$25 million.

Precision, which had revenues of approximately \$10 million in fiscal 1991, is one of only two companies selling Windows 3.0 databases—a potentially lucrative market, analysts said.

To date, SPC has purchased technology from Samna Corp.

for Professional Write Plus, its Windows word processor, and acquired code from Arta Software Inc. for its forthcoming Windows drawing program, code-named Gungster.

Having a Windows database program would broaden SPC's Windows line—which currently includes Pro Write Plus and the newly announced Harvard Graphics. Windows versions of InfoAlliance and Harvard GeoGraphics are forthcoming, SPC officials said.

The deal pits SPC's line against such companies as Borland International Inc., Lotus

Development Corp., and Microsoft Corp., which are also releasing suites of Windows products.

The acquisition of Precision is subject to approval by the board of directors of both companies, said Kevin Conway, vice president and general manager of SPC's information access division.

Precision is expected to remain headquartered in Surrey, England, and to continue to operate its U.S. office out of Irving, Texas. John Tranner, Precision's founder and chairman, will remain in charge of database products.

## HP Readies Entry-Level 68040 Workstation

Will Compete With Low-End Sparcstations

By MARTIN MARSHALL

Hewlett-Packard Co. this week will take aim at Sun's low-end RISC products while also extending the life of its Motorola-based workstation line, according to sources close to the company.

### COMDEX '91

The vehicle will be the HP 9000 425e (the 'e' stands for economy), which will be shown either privately or in HP's booth at spring Comdex.

The system will be positioned against the popular Sun Sparcstation IPC and the entry-level Sparcstation SLIC.

HP would not comment on the unannounced product. The Model 425e reportedly uses a 25-MHz Motorola 68040 processor, and it has built-in graphics support for both color and gray-scale displays with 1,280-by-1,024-pixel resolution.

It will feature a SCSI port, the Hewlett-Packard Interface Language port, three serial ports, digital audio input and output

ports, and an Apollo keyboard socket.

A diskless version with 8 megabytes of RAM and a 19-inch gray-scale display will be priced at \$5,490. A 16-inch color monitor adds \$2,000 to that, and a 19-inch color monitor adds \$4,500. An additional 8 megabytes of RAM and a 200-megabyte hard disk, for \$4,000, will be offered as options. The system has built-in space for one 3½-inch drive and one 5¼-inch drive. No bus slots are built in, said sources who have seen the product.

Rated at about 11 SPECmarks, the model 425e overlaps the high end of the CISC workstation market and the lower end of the RISC market. Both its performance and its disk-included, color configuration price of just under \$12,000 are about the same as the Sun Sparcstation IPC, based on the Sparc RISC chip.

HP will also provide current HP and Apollo workstation users a trade-in allowance.

Hewlett-Packard Co., 19310 Pruneridge Ave., Cupertino, CA 95014; (800) 752-0900.

## How HP's 68040 Machine Stacks Up Against Low-End Suns

Feature	HP 9000/425e Basic	Sun SLIC	HP 9000/425e Color	Sun IPC (no GX)
Price	\$5,490	\$4,995	\$11,490	\$9,995
Specmarks	11.3	8.8	11.3	11.8
RAM	8MB	8MB	16MB	8MB*
Display	19" gray scale	17" monochrome	16" color	16" color
Resolution	1,280 X 1,024	1,152 X 900	1,280 X 1,024	1,152 X 900
Ports	3 serial	2 serial	3 serial	2 serial**

\* An additional 8MB is available for \$2,000 more. \*\* Also 2 S-Bus.

## Artisoft to Unveil Networked Voice Mail System, LANtastic for Windows

By JOE MANDSCH

Artisoft is branching out from its peer-to-peer operating system with the announcement today of a voice mail system that works on its own and other vendors'

### COMDEX '91

networks.

The company will also announce LANtastic support for Windows 3.0; native Windows software; a hub for connecting laptops and printers; and an Ethernet adapter.

ArtiScribe, the digital dictation system, is a pop-up utility that lets users record voice messages and retrieve the messages over a network. Users can record, play, and rewind messages using keystrokes or voice commands. It will work with LANtastic, NetWars, and other DOS-compatible networks.

The dictation system requires an Artisoft Sounding Board—a voice adapter including a handset for recording messages—plus the ArtiScribe software. The recording and playback processes can take place in the background.

ArtiScribe will cost \$499 for a two-station starter kit containing two Sounding Boards, one handset, one headset, and ArtiScribe software. A similar kit for Micro Channel machines is \$699. ArtiScribe software is \$149 per station. Sounding Board adapters sell for \$99 each for ISA machines and \$199 for MCA machines.

LANtastic 4.0 will run under Windows 3.0 in real, standard, and enhanced modes, said JoAnn Rockwell, product manager.

Versions of LANtastic 4.0 that support Artisoft hardware

cost \$99 for an unlimited number of users. However, the adapter-independent version of LANtastic/AT carries a higher price—\$2,499 for 300 users, up from \$495.

LANtastic for Windows, a separate module, provides a Windows interface to LANtastic's Net and Net-Mgr utilities. The utilities allow users to establish connections with the network and do administration. It costs \$299 per network and requires LANtastic 4.0.

Central Station is a small hub, measuring about 11 inches by 5.5 inches by 1.5 inches, that

lets users connect printers and portable computers directly to Artisoft or Novell network, Rockwell said. No price has been set for the hub, which includes two serial ports, a parallel port, and a PC interface port.

The \$349 16-bit Ethernet adapter, the AE-3, will run on thin or thick coax, or twisted-pair cabling.

All products will ship in June, except for the hub, which is slated to ship in mid-August.

Artisoft Inc., Artisoft Plaza, 575 E. River Road, Tucson, AZ 85704; (602) 293-6363.

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## SOFTWARE

## PIPELINE

## ALLIANCES

## ObjectVision Will Use Pen Windows

Portland International Inc.'s ObjectVision visual programming tool will support Microsoft Corp.'s Pen Windows operating system, Borland officials have announced. Borland showed ObjectVision running under Pen Windows at Demo '91 two weeks ago, but the product won't ship before Microsoft releases Pen Windows late this year. (408) 439-2096.

NCR Corp. and Lotus Development Corp. last week announced that NCR will distribute a Unix version of Lotus 1-2-3 with its System 3000 computers. Lotus 1-2-3 for Unix System V will run on the NCR System 3000 under both SCO Unix and Unix International V.4 operating systems. The bundle will be available in early summer. (513) 445-5278.

## ANNOUNCED

## WordPerfect Font Tool Introduced

LaserTools Corp. last week introduced font scaling software that enables WordPerfect users to print Hewlett-Packard LaserJet III scalable fonts on older model LaserJet, Ink-jet, and dot-matrix printers. Shipping May 31, the \$149 Font-on-the-Fly 1.0 includes 19 Agfa Compugraphic Intellifont outline fonts. (800) 767-8004.

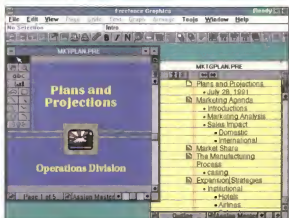
AristoSoft Inc. has announced a \$99 software screen expander, called More Windows, that gives users a virtual display resolution of up to 1,024 by 1,024 pixels. It allows users to scroll past screen edges. (415) 426-5355.

## SHIPPING

## U-Lead Systems Ships PhotoStyler

U-Lead Systems Inc. recently released its Windows 3.0 image editing program, PhotoStyler. Capable of processing 24-bit color, grayscale, and black-and-white graphic images, the \$795 package offers extensive color correction, conversion, and separation tools. (213) 538-8911.

Continued on Page 20



Lotus Freelance for Windows will enable users to open multiple views of their presentation, including outline format.

## Lotus, SPC Begin Bout for Windows Graphics Title

By LISA PICARILLE  
AND BARBARA DARROW

Lotus Development Corp. and Software Publishing Corp. are preparing to duke it out in the Windows presentation graphics arena.

Lotus will unveil a pre-beta version of its Freelance Graphics for Windows package at this week's Windows World show, in Atlanta. SPC announced new versions of Harvard Graphics for DOS and Windows last week. (See "SPC to Unveil Harvard Graphics for Windows," April 22, Page 1.)

While the announcements came close together, Harvard Graphics for Windows is not expected to ship until late this

year; Lotus may well beat the rival to market.

Code-named Remington, Freelance Graphics for Windows borrows several features from its OS/2 predecessor, which was introduced last fall. These include a suite of drawing tools, the capability to display multipage presentations on one screen, and 50 fill-in-the-blank templates called SmartMatters.

A new outline lists the text from each page view. Changes made to the outline view are reflected on the presentation page and vice versa. Freelance also supports Windows Dynamic Data Exchange (DDE).

While support for Object Linking and Embedding (OLE) **See Graphics, Page 10E**

## Q&amp;A Upgrade Beefs Up Presentation, Ease-of-Use, Programming Features

By YVONNE LEE

Attempting to attract relational database users to its flat-file manager, Symantec has added power, presentation, and ease-of-use features to Q&A 4.0.

Among its improvements, Q&A 4.0 includes enhanced programming features and can point to external databases. "I don't have false expectations that everyone's going to throw away dBase and Paradox," said Ted Schlein, vice president of Symantec's data management group. "What I do expect is they're going to be able to choose Q&A more often."

Previous versions of Q&A allowed users to look up information in external database files; 4.0 adds the capability to update information from one database file to another.

"Because you can do that, you can do something like an inventory control file," said Bob Bullock, senior systems analyst at Ciba-Geigy Corp.

Q&A 4.0's SQL link allows users to retrieve data but not to update it.

The company is currently shipping drivers for Oracle Professional and Gupta SQLBase. A forthcoming Sybase driver will be shipped to registered users, Schlein said.

Q&A's natural-language interface now provides pop-up lists of English phrases that allow users to build queries and reports without knowing verbatim database commands. Users can now also update information in a table view as well as a form view.

Word processing and printed output have been enhanced in

## Users Laud 1-2-3 2.3's Performance, Speed

Publishing Capabilities Also Garner Praise

By BARBARA DARROW

Early adopters of Lotus 1-2-3, Release 2.3 praise the program's speed and spreadsheet publishing capabilities — even when run on bare-bones 8088 and 286 machines.

Users were particularly impressed with the spreadsheet's WYSIWYG add-in, which is based on the Impress technology that Lotus acquired for Release 3.1 and later adapted for Release 2.3.

Release 2.3 started shipping two weeks ago and includes two other add-ins in addition to WYSIWYG: the Viewer and the Auditor.

The Auditor helps users debug their problematic formulas by tracing back the precedents of all the cells feeding into a formula. "It basically gives you the genealogy of your spreadsheet," said Rob Perry, senior product manager.

Users were also pleased with Lotus' approach to Release 2.3, as opposed to that of Release 3.1. "If you're going to stay with DOS and use Lotus, this is the product for you," said Dick Moffat, an independent consultant based in London, Ontario. "You shouldn't consider staying with 2.2, because this has better memory management. As far as I can see, Lotus should give up on Release 3."

Lotus plans to ship Release 3.1+ — which includes the

same three add-ins plus the Solver from 1-2-3/G — within the next 45 days.

The 3.1x series also lets users open multiple worksheets on a page and offers three-dimensional spreadsheets, as well as DataLens access to outside databases.

Another advantage that 2.3 offers over 2.2 is a background printing utility, which frees the CPU to execute other tasks while a document is printing, Perry said.

The Viewer, borrowed from Lotus' Magellan disk utility/text retrieval package, helps users find worksheets and spreadsheets easily and can ease data exchange between files, users said.

"It's great for pasting cell data in from other worksheets," said Jeff Smith, microsystems specialist at the Good Samaritan Hospital, in Cincinnati. "Before, you had to leave one spreadsheet, get into another, look up the data, write it down, and rekey it. Now, you just highlight it and pull it into your worksheet."

The package requires a PC compatible with at least 486K of RAM (512K for WYSIWYG), and DOS 2.1 or later. The program has a retail price of \$495.

Lotus Development Corp., 55 Cambridge Parkway, Cambridge, MA 02142; (617) 577-8500.



Enhancements in Q&A 4.0 include the capability to merge information from multiple databases into one document.

4.0. Users can create cross-tabular reports and highlight fields using font changes, boldface, underlining, and other character formatting.

The \$399 upgrade is sched-

uled to ship at the end of this month. Users of Q&A 3.0 can upgrade for \$85.

Symantec Corp., 10201 Torrey Ave., Cupertino, CA 95014-2132; (408) 253-9600.



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# Fifth Generation Gives FastBack Plus a Graphical Interface

BY TUSEDA A. GRAGGS

Fifth Generation Systems Inc. is putting a graphical face on the latest version of its DOS backup software, FastBack Plus 3.0 has a simpler user interface than the previous version and performs scheduled unattended backups.

The product, to be announced today, will ship at the end of the month.

The \$189 software now also includes an Express Menu system, file server support, and dBase-compatible history files. (See "FastBack PC Upgrade Due in April," March 18, Page 3).

The Express Menu system features pull-down and pop-up menus and mouse support.

Version 3.0 also provides an enhanced macro language, which contains a built-in

English-language macro editor, nesting capabilities to run other macros, single-stepping and debugging aids, suspend and resume features, and a Record Command Timing feature, which replays a macro at the speed at which it was recorded. The macro language also has a scheduler to enable unattended backups.

The backup utility supports Novell NetWare 286/386 and is capable of

backing up multiple volumes — such as drives C, D, and E — in a single session. It includes bindery and trustee rights on Novell NetWare networks.

FastBack Plus 3.0 also lets users compress data during backup, back up and remove old files from hard disks, and create DOS readable and usable files.

The program also allows users to combine data compression technology with Fifth Generation's proprietary format to store more data on disks during backup.

Registered users of the current version can upgrade for \$49.

Fifth Generation Systems Inc., 10049 N. Reiger Road, Baton Rouge, LA 70809-4562; (504) 291-7221.



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## Pioneer's Q+E 2.6 Delivers Full Access To DB2 Databases

BY SCOTT MACE

Windows users have a new way to access IBM's mainframe DB2 database, Novell's NetWare SQL database server, and Paradox files, thanks to the latest release of Pioneer Software's Q+E querying and editing program.

Q+E 2.6 for Windows and OS/2 Presentation Manager provides full read-and-write access to DB2 data using the Micro Decisionware Database Gateway. The gateway provides transparent access to DB2 for Q+E and other applications that use SQL Server's DB-Library API. The program will be demonstrated this week at Pioneer's Windows World booth, in Atlanta.

The previous version, also called Q+E 2.6, for both Windows and OS/2 Presentation Manager, already accesses SQL Server, Oracle, and OS/2 Extended Edition Database Manager, as well as non-SQL data sources. Q+E supports Dynamic Data Exchange (DDE) and can be used as a stand-alone database querying and editing tool. It can also be used as a database server for other Windows applications.

A simple transfer statement allows two-way movement of tables or data between DB2 and either SQL Server or OS/2 Database Manager on the network.

Q+E itself can sort, join, and filter databases, and lets users view several different databases simultaneously.

Pioneer has also announced Q+E Database Library, a collection of Dynamic Link Libraries (DLLs) that provide a common programming interface.

Many recently introduced Windows development tools and high-level macro languages are not able to directly access data from popular PC, network, and mainframe databases, making the Q+E DLLs a natural fit, said George Woltman, president of Pioneer Software.

Q+E Standard Edition supports dBase-compatible database files, XLS worksheet files, ASCII text files, and now Paradox files; it sells for \$199. Q+E Server Database Edition sells for \$299. Registered users of Q+E can upgrade for \$49. Q+E Database Library sells for \$399.

Pioneer Software, 5540 Centerville Drive, Suite 324, Raleigh, NC 27606; (919) 859-2220.

# E'Vent Manager Lets Users Take Control of Windows Environment

BY ED SCANNELL

Mersa Corp. recently launched an agent program for Windows that lets users automate PCs to run more efficiently by taking advantage of unused computer time.

E'Vent Manager gives users more control over the Windows environment. The program helps users make decisions about what commands to execute and when to execute them.

The program watches for certain events, such as keys being pressed or applications being opened or closed, and compares them to a set of conditions the user has previously specified. When those conditions are met, the program carries out the predefined commands.

Users can build English-style statements that describe the conditions being monitored by clicking through various lists of acceptable words. No programming knowledge is required.

Users can add hotkeys to any command in any application, as well as allow the same hotkeys to be used in conjunction with different commands in different applications.

The new program can also remember where users locate their files and applications on a hard disk, eliminating the need to look them up. E'Vent Manager can also automatically launch programs.

In addition, E'Vent Manager includes features commonly found in third-party utility packages. For example, an autosave feature can be attached to any Windows applications. Also, a "work set"

feature allows multiple applications to be simultaneously brought up on-screen and positioned to the user's liking.

The product, which requires no extra memory, will be formally announced at Windows World, in Atlanta. It will have a retail price of \$179.95.

Mersa Corp., 384 E. 720 S., Suite 204, P.O. Box 1918, Orem, UT 84059-1918; (801) 225-9951.

## Delrina Rolls Out Form Tracer, Fax Software At Windows World

BY TUSEDA A. GRAGGS

Delrina Technology Inc. will announce a form image tracing program and update its fax communications utility this week at Windows World, in Atlanta.

PerForm Tracer works with Delrina's PerForm Designer by converting a scanned image of a paper form into an editable format. PerForm Tracer recognizes objects on forms as lines and boxes, rather than just outlining a scanned image, thereby reducing the design time of converting complex or precision paper forms to electronic formats.

The Tracer program is compatible with both PerForm Pro Designer and Filler, which run under Windows 3.0, as well as with PerForm 2.1, which runs under GEM.

PerForm Tracer converts TIFF, PC PaintBrush, and MacPaint images to a PerForm form file. The program traces the scanned image of the forms at their actual sizes. The Tracer also allows users to rotate scanned forms and to configure tolerances for skewing, line thicknesses, and gaps between objects.

The Tracer is scheduled to ship during the third quarter, with a suggested price of \$495.

In addition, Delrina is introducing Winfax, a fax communication application that provides send/receive support for "send only" and class II-compatible fax boards.

The software can send a fax by choosing the print command from any Windows application. An incoming fax is received and is logged while other Windows or DOS applications continue to run without interruption.

Winfax also creates user-definable modem initialization strings for custom modem protocols, supports an unlimited number of phonebooks, matches partial recipient names and phonebook entries, and adds new recipients to the current phonebook. If transmission fails, only the pages that are not sent successfully are retransmitted.

Priced at \$119, Winfax is scheduled to ship June 30.

Delrina Technology Inc., 1954 Leslie St., Don Mills, Toronto, Ontario, M3B 2M3; (416) 441-3676.

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Continued From Page 13

## ALLIANCES

## PC Image Service Debuts on CD ROM

Metro Newspaper Service, which recently became available on CD ROM disc, is scheduled to begin shipping an IBM PC version of the CD ROM software by the end of this month. Each Metro LaserArt disc contains nearly 300 megabytes of EPS and TIFF images designed for use with any of the leading page layout programs. Prices range from \$58 to \$750 based on circulation figures. (800) 223-1600.

Adobe Systems Inc. announced last week that Lexmark International Inc. has signed on as a PostScript licensee. Under the agreement, Lexmark will incorporate Adobe's PostScript language interpreter into the printers it manufactures for use with PostScript printers. By licensing PostScript from Adobe, Lexmark has the freedom to incorporate the technology into future products it may design under its own label. (606) 232-3934.

## PRICE CUT

## IBM Drops Price On Current 1.2

IBM Corp. last week announced that Current, Version 1.2, its personal information manager (PIM), will be offered for \$129 when ordered directly from the company. The software has a suggested retail price of \$395 but will be offered at the reduced price until August 31. Current 1.2 is Windows 3.0 compatible and is designed for an IBM or compatible 286 or faster PC with a 20-megabyte hard disk and 1 megabyte of RAM. (800) 426-7699.

## ANNOUNCED

## Xionics Premieres Software Accelerator

Xionics Inc. has introduced ImageSpeed, a software accelerator that uses a proprietary scale-to-gray algorithm, which converts scanned monochrome images to gray scale before displaying them. This enhances the visible resolution of the images, according to company officials. ImageSpeed is driven by Xionics' ImageSoft Libraries, which run under DOS, Windows 3.0, and OS/2. Slated to ship in June, a 20-pack sells for \$3,000; a 50-pack is priced at \$5,000; and a 250-pack sells for \$10,000. (714) 971-4717.

Slater Hall Information Products has introduced a line of CD ROM discs that contain 1990 census data. The \$199 County-City Plus will be an update of County and City Databook. The County-City Compendium is a CD ROM containing the same data as the County-City Plus disc, as well as Census Bureau county statistics and county income and employment data. It will sell for \$600 until June 30. Both discs are expected to be released next month. (202) 682-1350.

## SHIPPING

## Brubaker Launches Worksheet Upgrade

Brubaker Software is now shipping an updated version of its Optimized Worksheet 1.1, which works with Lotus 1-2-3, Versions 1A, 2X, and Symphony, cleans up and trims down worksheets by optimizing underlying formulas in the background, the company said. Listing for \$99.95, the software requires a PC running DOS 2.1 (Version 3.1 or later is required for use on networks) and at least 320K of memory. (317) 497-2928.

Borland International Inc. is shipping Paradox SQL Link, Version 1.1, which connects to Sybase SQL Server in addition to previously supported SQL databases. The \$495 product is available now. Paradox SQL Link, Version 1.0 users can update for \$99.95. (408) 438-8400.

## UPGRADES

## Lotus Fixes Snafu With Release 3.1

Lotus Development Corp. has announced that the auto-sensing feature of currently shipping copies of Lotus 1-2-3, Release 3.1, now functions with 486SX PCs. Last week, InfoWorld discovered an incompatibility with earlier copies of Release 3.1 and the 486SX processor. Release 3.1.1, due out in two months, will also work properly with 486SX machines. (617) 577-8500.

genSoft Development Corp. is offering registered users of dBase for Windows, Version 1.5 a free upgrade to the multitasker version when it ships. The multitasker version, set to ship by midsummer, will cost \$695. The company will also begin shipping on June 1 a CD-ROM extra cost—a toolkit for the single-user version that adds a screen painter and report writer. Registered dBase for Windows users will receive the toolkit free. (206) 562-1157.

## Graphics

Continued From Page 15

is expected, it is not in the current beta version and may not be available when the product ships this fall, sources said.

Under Windows, Freelance incorporates the same floating icon Palette found in 1-2-3 for Windows—which will also make its public debut at the show, the company said. The icon Palette lets users construct custom palettes with frequently used functions. Freelance and 1-2-3 for Windows are also expected to ship with Adobe Type Manager.

Lotus has as yet established pricing for the product.

Meanwhile, in SP's court, Harvard Graphics 3.0 for DOS is expected to ship in June but the Windows version will not be available until the end of this year, or February 1992 at the latest, according to Fred Gibbons, SP's president and CEO.

Key features in the new DOS version include chart regions that let users modify only specific areas of the chart without affecting the entire image; more chart types; expanded font support; and an icon-oriented



Like Freelance Graphics for Windows, SP's Harvard Graphics for Windows lets users construct multiple views of a presentation.

drawing environment, according to Tess Reynolds, SP's director of graphics marketing.

The Windows version adds features such as support for DDE and a WYSIWYG interface. New features include the capability to launch applications from within the program, 30 professionally designed templates, and the capability to select an object without altering the grouping of objects.

Harvard Graphics for Win-

dows sports three methods of looking at presentation: an outline view, a slide sorter view, and a slide editor view. Changes made to one view are automatically reflected in the other views.

Harvard Graphics for Windows will offer file compatibility with existing versions of the program. Both versions are priced at \$595.

Software Publishing Corp., (415) 962-8910; Lotus Development Corp., (508) 557-8500.

## WindowBase Combines Open Access Front End, SQL Engine

BY MARK BROWNSTEIN

A new Windows database is the result of an alliance between two software developers who combine front-end expertise with SQL Engine technology.

Announced today at Windows World Expo, in Atlanta, WindowBase combines an Open Access-like front end, developed by Software Products International (SPI), with the Integra SQL engine from Coramandel Industries Inc.

The front end allows users to input, view, and update data through simple or complex forms, reports, or tables, according to SPI. Using button selections, edit controls, scroll bars, and check boxes, users can

automatically generate SQL commands without having to write SQL code. The product is compatible with SQL Server and is designed to be used with the Integra SQL engine to generate a subset of the Microsoft SQL Server commands.

WindowBase provides full support for Windows' Dynamic Data Exchange and Dynamic Link Libraries. In addition to offering access to SQL tables, the product will function as a gateway to SPI's Open Access II and Open Access III database files.

WindowBase will also simplify form and table creation, report writing, and query generation. The product will include a developers' kit and menuing

system, as well as database administrator utilities. An optional Integra SQL developer toolkit will provide C and C++ tools. Developers can distribute proprietary applications developed with WindowBase by binding them to a run-time version of Access-SQL, according to the company. Access-SQL, also from SPI, provides many of the SQL management tools of WindowBase.

WindowBase is set to begin shipping next month with a suggested list price of \$495; it will be available for \$149 for the first 60 days.

Software Products International, 10240 Sorrento Valley Road, San Diego, CA 92121; (619) 450-1526.

## RIX SoftWorks Offers Paint Program for Windows 3.0

BY MARK BROWNSTEIN

RIX SoftWorks is swelling the ranks of Windows 3.0 image editing programs with its announcement today of a paint program that allows editing of bit-mapped and vector graphics.

Introduced today at Windows World, in Atlanta, WinRIX is an image creation and editing program designed for Windows 3.0 and 3.1. To create and edit images, the initial version will allow users to draw from a palette of either 32,000 or 16.8 million colors. The palette size varies, based on

the number of bits used for the graphics to be created or edited.

Dynamic Data Exchange (DDE) capabilities will allow images to be integrated into other Windows applications supporting DDE. Pull-down and pop-up menus will give users control over image creation and editing. The product will incorporate Object Linking and Embedding (OLE) technology and will be compatible with Windows 3.1 when it is released.

WinRIX supports color scanners from Sharp, Ricoh, and Epson. In addition, the package includes drivers for IBM XGA,

TrueVision, RasterOps, and other displays.

RIX SoftWorks plans to begin shipping WinRIX at the end of June, with a retail price of \$495. Registered users of ColorIX VGA Paint may obtain a beta version, Version 0.99, for \$100. When the product ships, they may upgrade to 1.0 for an additional \$100. Registered users not choosing to purchase the beta version will be able to upgrade for \$200.

RIX SoftWorks Inc., 18552 MacArthur Blvd., Suite 200, Irvine, CA 92614; (714) 476-8266; (800) 345-9639.



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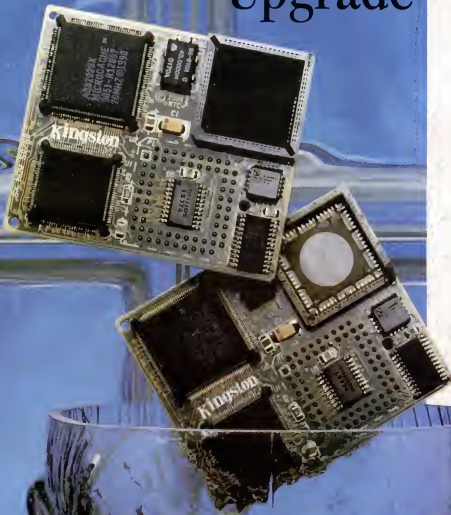
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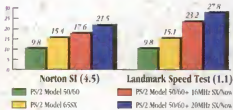


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# HARDWARE

## PIPELINE

### PRICE CUTS

#### Prices Cut on Entire Leading Edge Line

Leading Edge Products Inc. has cut the prices of its entire product line between 18 and 35 percent. A 286-based D2/Plus with a 40-megabyte hard drive will now list for \$1,199, compared to a previous price of \$1,495. At the high end, a 33-MHz 386-based D3/33 with a 120-megabyte hard drive now carries a suggested price of \$2,899, a 27 percent drop from its previous list price of \$3,995. (508) 836-4800.

Texas Instruments is cutting the price of its 286- and 386-based TravelMate notebooks by between \$830 and \$1,300. A \$3,799 TravelMate 3000 with a 40-megabyte hard disk had listed for \$5,999. The 286-based TravelMate 2000 with a 20-megabyte hard drive will sell for \$2,369, compared to a previous suggested price of \$3,199. (800) 527-3500.

### ALLIANCES

#### Reply Is Licensing Products from IBM

Reply Corp. has strengthened its relationship with IBM Corp. and is now licensed to offer IBM's Micro Channel SCSI Adapter, SCSI disk drives, ESDI drives, keyboards, and the same version of DOS 3.3 and 4.0 as IBM offers, along with an IBM version of OS/2 EE 1.3. Reply, an IBM business partner, manufactures and distributes MCA-compatible systems. (408) 942-4804.

### ANNOUNCED

#### NCR Is Offering MCA-Based 486SX

NCR Corp. has joined the 486SX bandwagon with the introduction of the 20-MHz 3335. The \$5,395 system comes with a Micro Channel chip set, Super VGA, 4 megabytes of RAM, a SCSI controller, 39-inch disk drive, and keyboard.

Tandy Corp. has introduced a 24-pin dot-matrix printer. The \$399.95 DMP 202 has a print speed ranging from 57 to 180 characters per second. For more information, contact a local Radio Shack outlet.

Continued on Page 24

## DEC Attempts to Crack PC Market

BY BARBARA DARROW

Digital Equipment Corp. hopes to erase the idea that a DEC PC is an oxymoron.

The centerpiece of DEC's strategy is the DECpc 433 workstation, which pairs a 33-MHz CPU with a special graphics board designed by Appian Technology.

The machine will attract users who want to get the most out of their investment in DOS, Windows, and OS/2 applications and will challenge the prevailing notion that DEC is not PC savvy, analysts said.

In addition to the DECpc

433, built by Intel Corp.'s Systems Group, DEC also introduced two portable systems built by Ing C. Olivetti, and the DECpc 433T, a system Tandy built for server applications.

"One of DEC's problems is that they've toiled along inside their installed base, offering a one-stop buy for VAX/VMS people who also want a few PCs," said Bill Bluestein, analyst with the Forrester Research Group, in Cambridge, Massachusetts. "With this thing, they can broaden their approach."

Pricing for a base DECpc 433 without monitor or hard disk is \$5,999 including 8 megabytes of

RAM, SCSI controller and choice of thick- or thin-wire Ethernet interface on the motherboard. A token ring connection will be introduced at PC Expo, sources said. The unit will support up to 1 gigabyte of combined disk, tape, or CD ROM storage via expansion boxes.

The DEC-designed controller is touted as improving standard resolution to 1,280 by 1,024 without any sacrifice of processing power, according to DEC officials.

The graphics controller — which will eventually be sold as a separate upgrade board — comprises a Texas Instruments 34020 graphics coprocessor operating at 32 MHz and 2 megabytes of on-board VRAM and incorporates seven custom Application Specific Integrated Circuits (ASICs).

The VGA-compatible board supports TIGA, 8514A, and RDG graphics modes and ships with drivers for Windows 3.0, OS/2 Presentation Manager,



The DECpc 433 workstation — the centerpiece of DEC's latest entrance into the PC market.

and SCO Open Desktop X Windows applications.

To further establish itself as a force in the PC industry, DEC is also going to look outside its traditional sales channels, adding a Dallas-based PC reseller — Microsolutions Inc. — to its reseller base.

The attempt is coming none too soon if DEC expects to make a dent in the PC market, analysts said. "They're two years behind HP and Compaq in terms of courting VARs," Bluestein said.

## Hercules Unveils Speedy Superstation 3D Board

BY MICO KRONH

Hercules Computer Technology Inc. has combined two unlikely bedfellows — Intel's i860 and Texas Instruments' 34020 graphics chip — on a board that gives users the 34020's extensive software support plus the i860's high-speed graphics.

Hercules put the 64-bit i860 coprocessor on its Superstation 3D along with the slower 34020 to take advantage of the 020's TIGA interface.

"The i860 is a new chip. There's not a whole lot of applications supporting it right now," said Will Frenz, director of product development for Hercules. "But the 34020... has been out there a while and it gives a great deal of application support."

Intel's chip will perform floating-point computations,

while the TI coprocessor will handle other graphics functions.

Hercules engineers haven't found the combination board to be slower than a board based on the i860 alone, Frenz said. But some graphics board vendors say it's slower because both chips need to access memory, sometimes simultaneously.

Users can get resolutions as great as 1,280 by 1,024 in 8-bit color, in addition to several other resolutions including the PAL video standard of 768 by 576 pixels in 24-bit color.

The card will cost \$4,495 with 2 megabytes of video RAM and 2 megabytes of program memory. It is expected to start shipping next month. It can also be configured with 4, 8, or 16 megabytes of program memory.

Hercules Computer Technology Inc., 921 Parker St., Berkeley, CA 94710; (415) 540-6000.

## CompuAdd Offers Multimedia 386SX for Less Than \$3,000

BY MICO KRONH

CompuAdd Corp. introduced a multimedia PC last week for \$800 less than a similar system Tandy introduced earlier this month. The CompuAdd 320c is a 386SX-based PC priced at \$2,995.

Tandy Corp., which introduced the first such system, offers a 386SX-based PC with a smaller hard drive for \$3,798.

Both companies are expected to ship their products shortly after Microsoft releases long-

awaited multimedia extensions to Windows 3.1.

Several other computer manufacturers, including NCR, NEC, Zenith, Fujitsu, and Philips are expected to release multimedia PCs this year, but none has yet announced shipment dates or product specifications.

The CompuAdd 320c will come with a multimedia card that includes digital audio support and an interface for the machine's internal CD ROM drive. Users can have as many as seven audio inputs with separate volume controls, which can be mixed. The system will also include Windows with multimedia extensions and two external speakers — a feature not included in Tandy's multimedia line-up.

The 320c will come with 2 megabytes of RAM, expandable to 32 megabytes; and 32K of external cache memory, expandable to 64K. The machine will also have an 80-megabyte hard disk drive, a 3½-inch 1.44-megabyte floppy disk drive, and a color VGA monitor.

CompuAdd officials plan to simultaneously release a multimedia upgrade kit for \$895 that will include a CD ROM drive, multimedia card, speakers, and Windows with multimedia extensions.

CompuAdd Corp., 12303 Technology Blvd., Austin, TX 78727; (512) 250-1489.

## NoteBook Computer Introduces 486-Based Notebook PCs

NoteBook Computer Co., which builds machines by installing new processor boards in Texas Instruments TravelMate PCs, is expected to introduce

today a 486-based notebook computer.

The 486NoteBook WorkStation family provides either 20-MHz 486SX or 33-MHz 486DX capabilities in a 4½-pound case, sans floppy drive.

Pricing for the machines ranges from \$4,495 for a 486SX-based system with a hard drive, to \$6,995 for a 486DX with a 60-megabyte hard disk. All of the systems are scheduled to begin shipping next

month, according to Gregg Young, company president.

LapLink software is provided in ROM to connect the 486NoteBooks to desktop host PCs for file transfers. For users needing a floppy drive, the company plans a snap-on extension called the "ePad" providing a 3½-inch disk drive, analog color monitor port, digital audio and speaker, SCSI interface, and keyboard port.

Pricing for the ePad, scheduled for shipment in July, was not announced.

NoteBook Computer Co., 1080 First Interstate Plaza, 1000 Louisiana St., Houston, TX 77002; (800) 473-4486.

—David Courtney



NoteBook Computer's 486-based notebook comes with a 486SX or a 33-MHz 486DX.

## Intel Flash Memory Chip Lets Users Upgrade ROM BIOS

BY LOUISE FICKEL

A reprogrammable chip that will let users update the ROM BIOS on their chips via software was introduced by Santa Clara, California-based Intel Corp. last week.

The new flash memory chip will make it possible for users to upgrade their systems by erasing and updating portions of the data on the chip, meaning users won't have to swap in new firmware to improve their systems.

Dell Computer Corp., in Austin, Texas, already plans to ship a system within the next two weeks using the 28F001BX chip. Several other developers have signaled their intention to deliver products using this technology.

Users won't be able to accidentally alter key portions of the BIOS, because the chip has an 8K "boot block section" that can be altered only by the systems manufacturer, said Bruce McCormick, product marketing manager at Intel's flash memory operation division.

SystemSoft, Phoenix Technologies Limited, A.M.I. and Award Software Inc. will support the chip, Intel said.

"This makes a lot of sense for manufacturers making nonstandard systems so that they [end-users or systems manufacturers] can update or add to the BIOS later," said Jonathan Joseph, vice president of product marketing at SystemSoft.

The flash memory chip will ship in volume by the end of this month and varies in price according to speed and packaging. The 150-nanosecond version in PDIP and PLCC packaging costs \$17.20 and the 120-ns version in the same packaging costs \$19.50. The 150-ns version in a TSOP package is priced at \$20.60 and the 120-ns version sells for \$23.40. All prices are for 1,000 unit orders.

## NCL Bundles ClearScan Hand-Held Scanner With Editing Software

NCL America Inc. is shipping its ClearScan 4-inch hand-held color scanner with Paintbrush IV Plus software for editing page-width photos, illustrations, and color graphics.

The ClearScan, which supports AT- and PS/2-compatibles and DOS applications, recognizes 4,096 colors at resolutions up to 400 dots per inch.

On-screen image reproductions can be optimized by creating 256-bit color palettes for each photo in Paintbrush IV Plus. Before an image is displayed the customized software automatically optimizes the image.

The image editing software can also be used to cut, move, rotate, or create grayscale renderings, and add or delete lines. The edited file can be stored in TIFF or PCX formats.

The scanner and bundled editing software list for \$695. The package includes the scanner head, cabling, power pack, and 16-bit NCL host adapter card.

NCL America Inc., 1753 S. Main St., Milpitas, CA 95035; (408) 956-1040.

—Tuseda A. Graggs

Continued From Page 23

### ANNOUNCED

## Intel Introduces Memory Upgrade for IBM MC

Intel Corp. has introduced, and is shipping, its Above Board MC, designed specifically for IBM Corp.'s Micro Channel Architecture. The board, without memory, lists for \$399 and can accommodate as much as 32 megabytes of

memory. Intel has also introduced a Matched Memory Module for the Hewlett-Packard Co. HP, III, IIID and HP LaserJet printers. The board, which can accommodate 4 megabytes of memory, has a list price of \$195 for the 1 megabyte version and is scheduled to start shipping in June. (800) 538-3373.

Zenith Data Systems has introduced an 80486-based LAN file server product, the Z-486/33ET, which will be offered in two models ranging in price from \$11,749, without hard drive, to

\$14,999 for a system with a 338-megabyte hard drive. (800) 553-0331.

Computer Peripherals Inc. has introduced its ActionSet font cartridge for the Hewlett-Packard Co. LaserJet II and compatibles, with 102 fonts, at a list price of \$199. (800) 854-7600.

CompuAdd Corp. has signaled its intentions to release a digitizing board in the fall that will convert National Television Standards Committee analog signals into a digital signal, allowing users

# ZENITH DATA SYSTEMS UPSETS THE BALANCE

**MastersPort 386SX**  
The fully-featured notebook that sets the standard for the Intel 80386™ SL microprocessor. Its Premier System Management™—with two separate resume modes—lets you hold work in active memory for weeks at a time.





# ALR's Proprietary Disk Array Subsystem Ignores RAID Technology

BY MARK BROWNSTEIN

Advanced Logic Research is introducing a proprietary version of a disk array subsystem for PCs, ignoring the University of California at Berkeley's RAID (redundant arrays of inexpensive drives) architecture definition that is forming the basis of most array technology now coming to market.

The ALR Powerpro Array, which will initially be offered as part of ALR's Powerpro systems, is built around a proprietary drive controller and ALR-certified IDE drives.

The Powerpro is similar to Compaq Computer Corp.'s Systempro, and future versions of the ALR Powerpro Array will be compatible with Systempro computers, an ALR engineer said.

The Powerpro Array controller is a 32-bit EISA bus master controller. It is shipped with a 2-megabyte cache, expandable to 8 megabytes.

Up to four 210- or 340-megabyte drives can be supported by the controller. A fifth drive, used by ALR as a parity drive, is also supported. While the parity drive slows performance, in the event of failure by one of the drives in the array,

the parity drive can be used to reconstruct the data on the defective drive.

When used as an array, minimal overhead is required to manage the striping and other array functions. Thus, on a four-drive system using the 210-megabyte drives, nearly 800 megabytes of actual capacity are available.

For data security, drives in an array can be mirrored. A two-drive system can have one mirror drive, while a four-drive system can have two mirror drives.

The array controller uses a standard interface to support DOS, Novell NetWare, and SCO Unix. The controller is firmware upgradeable and can be upgraded by downloading new code or installing it from a floppy disk. BIOS information is recorded in memory on the controller and to a reserved portion on the drives. If the BIOS data are incorrect at boot-up, it will be read from a drive in the array.

Future versions that support SCSI drives and versions for ISA-bus systems will be offered, a company spokesman said.

The ALR Powerpro Array will initially be available preconfigured in Powerpro systems. The Powerpro systems with the drive array technology will range in price from \$16,995, for a 33-MHz i486 system with 420 megabytes of hard disk storage, to \$22,995 for 1.36 gigabytes of storage. Systems are set to begin shipping in July.

Advanced Logic Research Inc., 9401 Jeronimo, Irvine, CA 92718; (714) 581-6770.

## PC Help Is Only a Phone Call Away

### PC World Paradox 3.5 Power Programming Techniques

by Greg Salcedo & Martin Rudy

Special Preface by Richard Schwartz, Borland International



- Features complete coverage of PAL, SQL Link, Paradox Engine and the new release
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## Ergo Announces 'World's Smallest' 486-Based System

Ergo Computing Inc. last week announced what it says is the world's smallest 486-based system.

With a name that belies its size, the Moby Brick portable is available in two versions, one based on a 486SX chip and the other on the 486DX. Both are 486 versions of an existing Ergo portable, called Brick, and feature a docking terminal connecting the units to peripherals.

The systems, without keyboard or monitor, measure 3.3 inches by 8 inches by 11.3 inches and weigh 8.7 pounds. They are positioned as "portable desktop" units that can be plugged into monitors and keyboards in the office and home.

The standard configuration of both units is 4 megabytes of memory, a 3½-inch 120-megabyte hard disk drive, and a built-in 2,400-bit-per-second Hayes-compatible modem. The system has one 16-bit half-length expansion slot. The optional Docking Terminal, priced at \$395, gives users a second, three-quarter-length expansion slot.

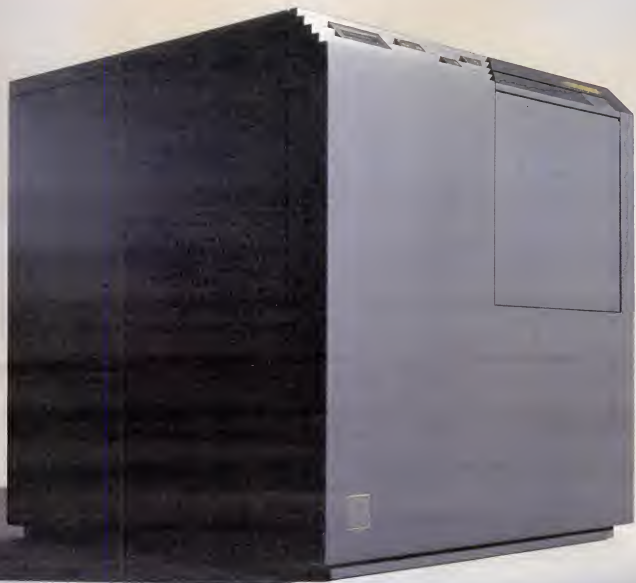
The 20-MHz 486SX Moby Brick is \$3,995 while the 33-MHz 486DX model is \$4,995, not including keyboard or monitor.

A system with a 14-inch 1,024-by-768 color VGA monitor is \$4,995 for the 486SX and \$5,995 for the 486DX version.

Ergo Computing Inc., 1 Continental Way, Peabody, MA 01960; (508) 535-7510.

—Ed Scannell

This is what the  
world's most powerful 486  
system looks like.



**ETMS:** Everex Thermal Management System, makes this the first system to solve the high temperature and related reliability problems of current and future processors. A partition separates the cube into two compartments, independently cooled by SmartFans. One contains the CPU, one the drives. Baffles funnel cool air where it's most needed. Even the power supply is cool, because at 400 watts, it runs at a fraction of its capacity.

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Removable motherboard for instant upgrades, which we'll bring you as new technologies emerge.

All the full-length expansion slots you'll ever need—12 altogether, including 10 EISA slots. The cube is also available in 8 slot ISA configurations.

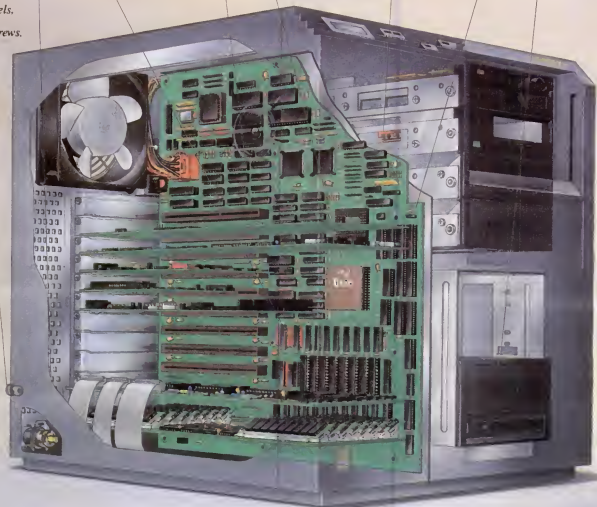
**AMMA**, a 256KB write-back caching architecture, forming "two-tier" caching in combination with the 486 chip's 8KB internal cache. It improves the cache hit ratio from 90% to as much as 99%.

Space for four quick release, half-height drives. They're front accessible, behind a hydraulically damped door—which makes sure your drive heads are reading disks and tapes, not dust, smoke and humidity.

The entire interior of the cube is accessible in seconds through side panels, using thumbscrews.

The 486/33 CPU chip, Intel's hottest. But when hotter chips come around, the cube will be cool enough to handle them. And that includes multiprocessors.

Quick release drive bays accommodate up to four more drives that can be swapped out in less than five minutes.





# And this is why.

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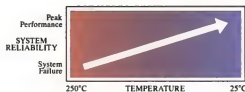
Even the future.

You see, the design breakthroughs of

the STEP Megacube eliminate the upgradability problems inherent in other systems. Which means that when the next generation processors arrive—like the 50 MHz 486, just down the road—all you have to do is swap out motherboards. No space problems. No overheating problems.

No obsolescence.

Performance-wise, this is a machine that will be hot long after others are cold and buried. In fact, as of now, there's no end in sight to the STEP Megacube's upgradability path.



*The Everex Thermal Management System (ETMS) improves system reliability by reducing internal temperatures.*

But really, that shouldn't be much of a surprise. After all, at Everex, our mandate is "Always innovate, never compromise." And that's exactly the approach we took when we built the STEP Megacube.

Granted it doesn't look like your typical 486 system. Fortunately, it doesn't perform like one either. To find out more about what it can do, give us a call.

*For a free copy of the STEP Megacube Application Guide, call:*

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## Introducing the STEP Megacube.



## Leading Edge Takes the Notebook Plunge With Two 386SXes

This week Leading Edge Products will use the Comdex show as a springboard into the lucrative notebook computer arena with two 6.9-pound 386SX models.

The N3/SX incorporates a 16-MHz CPU, one 1.44-megabyte floppy drive, a 20-megabyte hard drive, and a 9-inch triple supertwist LCD display with VGA resolution.

One megabyte of RAM is standard, and the system can accommodate as

much as 5 megabytes.

The N3/SX20 uses a 20-MHz 386SX and comes with either a 30- or a 60-megabyte hard drive.

Both units work off an AC power adapter or can use nickel-cadmium batteries for as long as three hours.

Interfaces include one 25-pin parallel port, one nine-pin RS-232C serial port, and an external VGA monitor port. A proprietary slot accommodates an op-

tional 9600 bps modem costing \$399.

Scheduled to ship this month, the N3/SX lists for \$2,595, while the N3/SX20 with 30- and 60-megabyte hard drives lists for \$2,895 and \$3,195, respectively. MS-DOS 4.01 and GW-Basic are shipped with the systems.

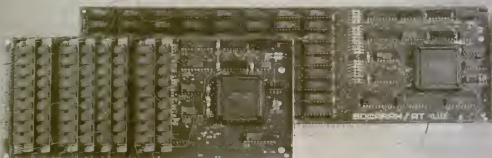
Leading Edge Products Inc., 117 Flanders Road, Westborough, MA 01581; (508) 836-4000.

— Barbara Darrow



Leading Edge's N3/SX line offers 16-MHz and 20-MHz systems.

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RESEARCH INC.

## Acma Lowers 386, 486 Prices, Releases Entry-Level 386SX

BY TOM QUINLAN

Acma Computers Inc. has introduced a 386SX system for less than \$1,000 and has lowered the price of two of its entry-level 386 and 486 systems.

The new 386SX system features a 16-MHz processor, 2 megabytes of RAM, a 5 1/4-inch floppy drive, a monochrome monitor, and a hard/floppy disk controller, at a list price of \$895.

Acma's 25-MHz 486 and 33-MHz 386DX come equipped with 4 megabytes of RAM, 5 1/4-inch and 3 1/2-inch floppy disk drives, an 80-megabyte hard disk drive, a 16-bit VGA monitor with 512K of memory, a 14-inch VGA monochrome monitor, and DOS 4.1.

The 486/25 system now lists for \$2,599, compared with a suggested price of \$2,899 previously.

Acma's 386DX-based system, which also comes equipped with a math coprocessor socket, is now priced at \$1,899. The system was listed at \$2,199.

All of the systems are currently shipping.

Acma also markets a line of 486-based systems equipped with a 32-bit EISA bus for the personal workstation marketplace.

Acma Computers Inc., 117 Fourier Ave., Fremont, CA 94539; (800) 456-1818.

## Microscience Rolls Out 414MB Hard Drives for ESDI, SCSI Systems

Microscience International Corp. recently introduced two 5 1/4-inch 414-megabyte hard disk drives.

The PH-2414 features a SCSI interface, and the FH-2414 has an ESDI interface.

The 414-megabyte drives have average access times of 14 milliseconds; they have head positioning times of 3 milliseconds.

As much as 15 megabits of data can be transferred per second. Both drives feature five platters and are designed to resist shock and vibration.

The PH-3414 and FH-3414 will both sell for \$1,100 each. Both drives are available now.

Microscience International Corp., 90 Headquarters Drive, San Jose, CA 95134; (408) 433-9898.

— Mark Brownstein

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# Pocket Power

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# WORKSTATIONS

## PIPELINE

### ANNOUNCED

#### S-Trac Trackball for Workstations Ships

A 3-inch-wide trackball with variable dynamic gain from 100 to 600 dpi that works with Sun or Silicon Graphics workstations was announced last week by MicroSpeed Inc. The S-Trac comes with RJ-11 or DIN-8 connectors for the full line of Sun workstations. A DB-9 connector version is also available for Silicon Graphics workstations. No additional software is required for the S-Trac. It is priced at \$199 and will ship this month. (415) 490-1403.

### SHIPPED

#### AlfaShip Ships Poste X.400 E-Mail App

AlfaShip Software Inc.'s Poste, a graphically interfaced X.400 E-mail package, is now shipping. Poste allows users of LAN-based X terminals and workstations, and shared servers to send any type of document—including compound documents and multimedia—in a single E-mail message with application software such as Wingz and FrameMaker. A single-user copy is \$395; volume discounts are available. (617) 497-2922.

\*\*\*

Silicon Graphics Inc. last week finally shipped its revision DGS Software Developers Kit. The Invision board was announced last fall. The SDK allows programmers to incorporate real-time 3-D, motion, and color into DGS and Windows applications using its Graphics Library calls that Microsoft licensed last month from Silicon Graphics. The Invision SDK is priced at \$2,895 and includes a year of technical phone support. (800) 388-6272.

### PRICE CUTS

#### Datality Reduces Prices on Servers

Datality Inc. has lowered prices on its 8- and 16-port terminal servers for DEC and Unix workstations. The 8-port VCP-200, originally priced at \$2,199, now costs \$1,499. The 16-port VCP-300 now sells for \$1,999, down from the original \$2,599. The offer lasts until June 30. (212) 807-7800.



Sun's AnswerBook lets users search all of Sun's documentation through natural-language queries and cut and paste results.

## Sun Puts Documentation On 'AnswerBook' CD ROM

BY MARTIN MARSHALL

A CD ROM containing the equivalent of over 200 Sun user manuals will be available this week from Sun Microsystems Inc., the company has announced.

The System Software AnswerBook, with 250 megabytes of information, is a sophisticated full-text search and retrieval engine from Fulcrum Technologies of Ontario, Canada.

It allows the user to click on a table-of-contents entry and immediately view the appropriate page. With hypertext links, users can also click on a cross-reference in the text and jump to a related topic, even if it is in another manual.

A "bookmark" feature lets users quickly return to pages of interest. It uses the Open Look graphical user interface, and presents complete pictures of the page, preserving diagrams, type styles, and sizes.

In addition to traditional Boolean word searches, the

AnswerBook also has a natural-language access method.

"The user can type in a phrase like 'How do I install a new printer?' and the AnswerBook will figure out the most relevant citations and list them for the user in order of relevance," said Sun product line manager Mark Berrow.

"The user does not need to know Unix to use this product," said Rich Sands, AnswerBook product manager. "He can become proficient in less than half an hour."

The AnswerBook can be used across a network, but because Sun does not yet have floating license software for it, Sun charges a fee for every workstation on the network. The first workstation use is \$495, while additional licenses are \$250 each.

"We are working on incorporating floating licensing, but that isn't here yet," Berrow said. Sun Microsystems Inc., 2550 Garcia Ave., Mountain View, CA 94043; (415) 960-1300.

## XVision PC Server Software Ships

Visionware Ltd. of Cambridge, England, will ship its X Window server software next month, more than two months later than the April delivery that was previously announced.

XVision 4.0 turns a PC into an X Window server running MIT's X11.4 protocols. It presents a Windows 3.0 interface to the PC user to control both Unix and DOS applications, and it allows for sorting and pasting information between DOS and Unix applications.

The product contains a local window manager, which signifi-

cantly improves performance when compared to a host-based window manager.

Following the X11.4 protocols, XVision 4.0 provides support for "backing store" and "save under" features. These features store the contents of a window that has been obscured by a window placed on top of it, so that it can be quickly restored on the screen.

XVision 4.0 is copy-protected and will sell for \$449.

U.S. distributors: (201) 985-8000, (503) 641-2200.

— Martin Marshall

## Sub-\$6,000 Sparc Notebook Announced

BY MARTIN MARSHALL

Move over PC notebooks, the Sparc notebook is coming. Tadpole Technology Inc. will announce this week its 6.9-pound SparcBook 1, which it promises to ship in July.

At under \$6,000 for a complete system, it will also be priced competitively with the low-priced Sparc clone desktop market. Using a 25-MHz LSI Logic Sparc chip, the SparcBook 1 packs 18 MIPS (about the power of a Sparstation 1+) into the package.

The SparcBook 1 is designed for a variety of Unix users, from finance professionals to field sales and service staff to medical systems and software demonstrators.

The unit comes with a battery that lasts at least 2½ hours, a choice of a 60- or 120-megabyte hard drive; a 64-shade, paper-white, gray-scale, backlit LCD with 640-by-480 resolution; an external color video output; and serial, parallel, and Ethernet ports. A modem and a SendFax feature are also integrated into the system.

Tadpole handles the differ-

ence between the SparcBook 1's 640-by-480 display and the standard Sun resolution of 1,120 by 900 by offering the user two viewing modes. In the condensed mode, a lower resolution version of the entire screen is presented. In the full-resolution mode, the full 1,120-by-900 display is kept in RAM, and the user can move around in a 640-by-480 window of that display.

To save power there is a transparent mode, in which the processor clock is stopped when the processor is idle. The clock is restarted when an external event such as a keystroke is received. There is also a 12½-MHz mode that saves power during word processing and other non-processor-intensive applications. The battery takes over immediately when the external power source is interrupted.

Software Solutions' Soft PC DOS emulation will also be provided with the system.

Tadpole is a Cambridge, England-based company with a division, in Austin, Texas.

Tadpole Technology Inc., 8310 Capital of Texas Highway N., Austin, TX 78731; (512) 338-4462.

## NCD Offers Multiwindow ASCII Network Terminals

BY MARTIN MARSHALL

Network Computing Devices Inc. last week introduced two monochrome multiwindow network terminals that improve upon the capabilities of normal ASCII terminals.

ASCII terminals are usually connected to an Ethernet-based network through a terminal concentrator, and they can usually only display one application screen at a time.

NCD's terminals connect di-

rectly to the Ethernet, eliminating the need for a terminal concentrator. They can also display up to eight windows of character-based applications on a screen, each running a different application, and communicating with a different host.

The terminals also allow users to cut and paste text between windows, as well as resize and overlap windows.

Character-based files are displayed within either a Motif or Microsoft Windows 3.0 window, giving a highly graphical look while maintaining a straight text environment within each window. To each remote application, the multiwindow terminal appears as a VT220 emulator.

The 15-inch MWT15B, priced at \$1,695, has 1,024-by-800 resolution, while the 19-inch MWT19, priced at \$3,400, has 1,280-by-1,024 resolution. Both terminals will begin shipping next month.

Network Computing Devices Inc., 350 N. Bernardo Ave., Mountain View, CA 94043; (415) 694-0630.



NCD's multiwindow terminals can handle up to eight applications simultaneously.



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## TECH TALK ■ BY STEVE GIBSON

# Visual Basic Provides Astonishing Intellectual Power Toy

the of our marketing, public relations, and news delivery professionals, we're continually bombarded with stories of

"new and revolutionary products." Most of us have become so hardened to the endless hype that we've developed a healthy insulating skepticism to help keep our expectations in line with reality.

About six weeks ago *InfoWorld* reported on an unreleased product from Microsoft, code-named Thunder. Because Seat-

tle bureau chief Stuart Johnston's story about this new Windows product, reportedly to be named Visual Basic, sounded quite interesting. I arranged to have Microsoft bring me up to speed. Their subsequent presentation of Visual Basic, followed by the 40 sleepless hours I spent riding in front of my computer exploring this stunning new miracle, has blown my well-placed skepticism into oblivion.

In order to discuss Visual Basic's earthshaking impact, we need to invent a new term. Let's define a language environment's *leverage* to be that totality of characteristics that empower programmers to achieve their goals. Writing in the native 0- and 1-bit machine language of a microprocessor provides so little leverage that no one does it. The lowest and least leveraging practical environment for implementing computer solutions is assembly language, just one short step above raw machine language. The world has since developed a succession of languages, each providing varying degrees of programming leverage. APL, Basic, Cobol, Fortran, Forth, Pascal, C, Smalltalk, and object-oriented dialects of Pascal and C all offer differing leverage.

**BREAKING THE SCALE.** An equally important aspect of leverage is a language's development environment. UCSD's original Pascal environment, followed by Borland's Turbo Pascal successes, showed many of us for the first time what an integrated development environment with a short edit, compile, and test cycle could mean.

Any quantification of an environment's leverage is necessarily a subjective call, encompassing the programmer's individual skills and needs. However, if we were to use assembly to establish a baseline with a leverage factor of one, then cluster all remaining contemporary languages and their development environments in the range of 10 to 15, I'd place the leverage offered by Microsoft's Visual Basic somewhere between 200 and 500. It is that good. It's so good that there's never been anything like it.

This appraisal of Visual Basic will doubtless be disputed by competing language and environment vendors. For example, the Smalltalk people will argue that they've always had an inherently integrated and object-oriented graphical environment. OK. But Smalltalk went too far into object-manipulation for accessibility by casual programmers. The ToolBook people will argue that their product is super-easy and offers lots of leverage. Although ToolBook is a highly leveraging solution, its application domain is skewed from the mainstream, which Visual Basic meets with great elan.

I've been a dyed-in-the-wool assembly programmer forever. My commercial products and all of my quick little utility programs have always been written in 100 percent assembly. Interesting as the Quick and Turbo environments have been, they haven't offered me enough extra leverage to make up for the loss of assembly's supreme power and control. Visual Basic has finally changed that. Visual Basic has finally changed me. During the past week I've joyfully produced five really useful custom Windows applications that are every bit as good as anything available commercially. What's

more, I've noticed that Visual Basic so encourages interactive exploration that in some significant ways my little applications offer features superior to those found in any commercial Windows applications.

One of the curious and subtle things I've noticed is that programming in Visual Basic makes me feel good about myself because of what I can now produce. One day, at a time the day of personal computing, when chattering Teletypes spit out low-resolution bi-rhythm charts, it was easy to impress people and amaze your friends. Those days are gone. Our expectations of computer behavior and interaction have so far outstripped the average programmer's ability that we've all but given up on that aspect of the computer as hobby. Visual Basic changes that. It is, perhaps, the greatest intellectual power toy I've ever experienced.

Excel is a great spreadsheet, and Designer and CorelDraw are tremendous drawing packages. Even so, they do little to override my overall frustration with Windows. I have never operated within the Windows environment full time because it interfered with everything else I wanted to do during the day. There are a lot of things that I don't like about Windows, chief among them is the feeling, confirmed by GeoWorks Ensemble, that Windows could be a whole hell of a lot better than it is. I'm pissed off that something I want to use, and that I know could be better, is getting in my way all the time. But Visual Basic changes that, too.

Visual Basic might not make me like Windows any better, but it has already made me hate Windows a lot less. After spending numerous days trying to make Windows compatible with my working environment, it looks as if I'm going to have to become compatible with Windows.

I believe Visual Basic to be the master-stroke of the decade. So many separate pieces of Microsoft's past work have slipped so perfectly into place in Visual Basic that one wonders whether Bill Gates might not really have a master plan after all. If so, I sure like where he's taking us. Windows' slowly maturing visual metaphor, Microsoft's incremental compiling, interactive threaded, P-Code language technology, and a number of completely new implementation and development-environment organizing inventions have all come together to produce a result of compelling power.

I've had a long-running disagreement with Microsoft over their continuing use of the name Basic. Their product marketing and public relations people keep telling me that their research reveals "basic" to be a less threatening name for something as inherently frightening as a programming language. I keep telling them that programming is inherently a "magic thing" and that "real programmers don't use Basic." In my view, the good news is that Visual Basic's results are so good that even Microsoft's naming it Basic won't keep anyone from using it. Next week I'll tell you why.

Steve Gibson is the developer and publisher of SpinRite and president of Gibson Research Corp. of Irvine, California. The views expressed are his own.



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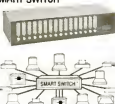
- Compatible w/all popular graphics, word processing & spreadsheet software including Microsoft® Windows
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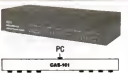


Share the convenience and power of today's popular file-transfer utility software with up to 5 other PCs. TransFerNet's high-speed, long-distance data drives let you transfer files from anywhere in your office. Comes complete with: • Network unit • 4-high speed serial port drivers • 4-50 foot, telephone-style, snap-in cables • Pop-up, PC-select software

#### Features:

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  - Any-PC-to-any-PC connectivity
  - Locate PCs up to 500 feet from TransFerNet unit
  - Can be used w/LapLink™, LapLink™ Mac, DESK-LINK™, HOT WIRE™, Brooklyn Bridge™, FASTLINK™ and other popular file-transfer utilities
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is also available.

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- Data broadcasting
- Industrial robotic control
- Numeric control programming
- Remote access for multi-device interrogation

#### Features:

- Instantaneous high-speed switching
  - Broadcast capability
  - Select prefix codes
  - Up to 1K 2K baud transfer rate
- Model No.:
- CAS16A—16 RS-232 devices to one computer or modem ... **\$995**
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## LINE DRIVERS



TURBOCable enables you to extend your utility PC-to-PC file-sharing distance and still maintain a high transfer rate. TURBOCable can transfer data at a speed of 115K baud up to 750 feet between PCs due to a newly-developed, high-speed RS-232-to-unbalanced line converter which can transfer data at high speed over long distances with excellent noise rejection.

TURBOCable comes with: • Two high-speed serial ports • Power adapter • 100 feet of telephone-style, snap-in cable. (Longer-length cables are available)

Features:

- True 115K baud throughput
- Locate PCs up to 750 feet from each other
- Easy installation—connects between PC's serial COM ports
- Can be used w/LapLink™, LapLink™ Mac, DESK-LINK™, HOT WIRE™, Brooklyn Bridge™, FASTLINK™ and other popular file-transfer utilities
- Compatible with IBM®/Apple®/Macintosh™ popular PCs & laptops
- DTE or DCE selectable

Model No.:

- TC-115 ... **\$140**



The distance between your computer peripheral is no longer restricted to a mere 50 feet. Now your peripherals can be located wherever your data communications equipment happens to be. The LD Series line drivers convert a RS-232 signal to industry standard RS-422 unbalanced lines. Using inexpensive telephone-style twisted pair wiring, you can achieve data rates in excess of 50 kbps and transmission distances up to 5000 feet. In addition to speed and dis-

talance, RS-422 unbalanced lines have excellent immunity to electrically induced noise caused by electrical interference which could cause glitches if using standard RS-232 circuits.

- Transmit data up to 5000 feet
  - Accelerate communication with speeds up to 50 Kbps
  - Reduce immunity to electrically induced noise
  - Remote units available for data only or data plus flow control
  - Quick connect and disconnect; uses two or four twisted-pair wire
  - DTE or DCE selectable
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- LD-1—Remote Unit, Data Only ... **\$45**
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Reduce cabling costs and increase terminal placement options with a pair of "mini" multiplexers. Up to eight asynchronous ports can simultaneously communicate at speeds up to 9600 baud over inexpensive twisted pair telephone wire or existing RS-232 cabling. The "Mini" Max is just over an inch thick and can easily mount on the wall or behind work stations to free-up desk space and reduce unsightly cable clutter. Connection is a snap with

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# NETWORKING

## PIPELINE

### ANNOUNCED

#### FTP, Concord Offer OSI, TCP Links

FTP Software, Inc. and Concord Communications Inc. have announced products that provide concurrent OSI- and TCP/IP-compatible communications on one PC. Concord's Maware controllers and FTP's PC/TCP products allow users of Manufacturing Automation Protocol to access network resources and transfer files from PCs communicating over TCP/IP on an 802.4 Ethernet LAN. The Concord NDIS interface, bundled with the company's OSI software, costs \$750 per site. PC/TCP for DOS costs \$400, while PC/TCP for OS/2 costs \$575. FTP can be reached at (617) 246-0900 and Concord at (508) 460-4646.

Lotus Development Corp. and SoftSwitch Inc. have introduced a gateway that lets Notes users exchange mail with users of more than 50 E-mail systems that are already supported by SoftSwitch. Installed on a Lotus Notes server, the SoftSwitch Lotus Notes gateway also lets Notes users exchange revisable documents and binary files with users on the other supported systems. Sited to ship in the third quarter, the gateway's pricing starts at \$4,995, (215) 640-9600.

Shiva Corp. is offering Dial-In Network Access users upgrades at no cost to assure compatibility with Apple's System 7. Available next month, the upgrade can be downloaded from Shiva's dial-in network, AppleLink, America Online, Connect, CompuServe, and the Internet. (617) 252-6400.

### SHIPPING

#### Mountain Ships FileSafe 7250-SCSI

With FileSafe 7250-SCSI from Mountain Network Solutions Inc., users can back up 250 megabytes of data onto a DC8250 cartridge at speeds of up to 5 megabytes per minute. The tape system comes with Mountain's FileSafe 5.2.2-SCSI software, which is fully compatible with NetWare 2.2 and 3.11. Pricing for the system ranges from \$895 to \$2,595. (408) 379-4300.

Continued on Page 40

## Unifi Phone Server Brings PBX Technology to PCs

Reliance on ISDN May Impede Acceptance

By BARBARA DARROW

Start-up Unifi Communications Corp. has launched a communications product that replaces automatic call distributors (ACDs) and public branch exchanges (PBXs) with PC-based systems. While analysts lauded the PhoneServer product as revolutionary, they said it may be impeded by its reliance on ISDN.

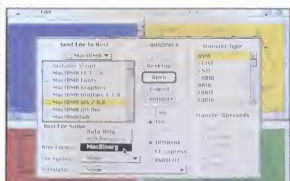
PhoneServer is SCO Unix-based software running on standard 386 and 486 machines that relies on the voice, data, and signaling features of ISDN. ISDN allows simultaneous transmission of voice and data over a single phone line.

PhoneServer's controller

module tells the network how to route calls; the manager module monitors and reports real-time network data; and the client package merges other applications with telephone services.

While PhoneServer accomplishes call distribution and routing at the PC, it relies on the extensive public network for switching.

"Our software talks smart to the public network, telling it where to send calls. You don't need a PBX or Centrex equipment," said Bill Thompson, vice president of marketing and sales. "End-users can be anywhere. The system can be programmed to route calls to people working at home, for example," he said.



MacBinary WorkStation's support of the MacBinary protocol lets users download files to Mac applications that support the protocol.

#### Upgrade of DCA's MacIrm Software Features File Translation Capability

By TYONNE LEE

Macintosh users will soon be able to download files from a mainframe and translate them on the fly using an upgrade of DCA's MacIrm software.

The \$295 terminal emulation package incorporates DataViz's file translation technology to convert Mac files to other Mac and DOS file formats as they are uploaded.

MacIrm Workstation supports the MacBinary protocol, a standard Apple protocol that lets users of any supported communications software download Mac binary files, retaining the data and resource forks.

MacIrm Workstation is scheduled to ship the end of this

month. A bundled version that includes the MacIrm Entry Emulator and a MacIrm coaxial adapter will retail for \$1,195.

The company has also released a new version of MacIrm Graphics that can view and translate IBM All Points Addressable Graphics.

MacIrm Graphics is an add-in module for any MacIrm 2.0.0. product, including coax, MacIrmLAN, or IrmLAN/EP. With it, users of Macintosh LC and other computers can emulate IBM 3179G and 3192G graphics. The \$195 product will also be available at the end of this month.

Digital Communications Associates Inc., 1000 Alderman Drive, Alpharetta, GA 30027-4199; (800) 348-3221.



Unifi's PhoneServer, with an X Window and OSF Motif display, shows connected icons that are part of its Call Routing Program.

The proposed scenario is more flexible because it gives corporate users more control over the public network, said Mary Johnston-Turner, principal with Northeast Consulting Resources Inc., in Boston.

While lauding the premise, some analysts warned that the company may have a tough time convincing end-users, especially because ISDN has met lukewarm reception.

"This is the stuff that ISDN was designed for — but their reliance on it will end up hurting them," said Jim Harrison, analyst with the Meta Group, in

Westport, Connecticut. "They have a serious marketing and user education process ahead to change the perception of how call processing should be done. And they are carrying with them the dead weight of ISDN."

Starting the second half of the year, Unifi will sell start-up packages to VARs or corporate accounts, comprising PhoneServer software, three Binary Rate Interface cards, an agent seat, training, and unlimited phone support for \$50,000.

Unifi Communications Corp., 4 Federal St., Billerica, MA 01821; (508) 663-7570.

## Mac Network Vendors Prepare For Impact of System 7 Release

By TYONNE LEE

With the release of Apple System 7 and its built-in file sharing, Macintosh peer-to-peer network vendors are repositioning their products to emphasize cross-platform connectivity, ease of use, and the capability of machines running System 6 to share data.

Sitka Corp. recently announced Version 3.1 of MacTops, touting its capability to connect with DOS and Unix, as well as its capability to let System 6 machines participate as full peers in the network. International Business Software, makers of the DataClub peer network, issued a release stressing a similar bridge to System 6, and ease of navigation with its Virtual Server technology.

System 7's file sharing capability lets connected Macs running System 6 access shared files, but there is no facility for these machines, often the low-end Macs, to pass files to machines using the advanced operating system. Vendors are hoping the large installed base of

System 6 machines will want to take advantage of peer-to-peer file sharing.

"What we think is going to happen is that probably only 40 percent of Macintosh users are going to be sharing data at the moment," said Nick Powell, president of International Business Software.

Although connectivity with System 6 machines solves a short-term problem, vendors admit they are not going to stake their long-term product strategy on it.

Sitka is working on Open Tops, an architecture that will let the network OS be ported easily to other operating systems, according to a company spokesperson. A product using the Open Tops architecture is expected for release in the fourth quarter of this year, she said.

International Business Software is planning to release a Windows version of the product, but declined to give a shipping date. Its current software allows DOS machines to share data on the network, but not to function as a server.

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internal scalable typefaces give you thousands of options. And, to make things even more interesting, the LaserJet IIIP produces patterns, shading, spirals, and mirror images. In portrait or landscape.

HP has picked up the throughput speed of this 4 ppm printer. Due to a considerably faster I/O rate, the LaserJet IIIP accepts data as quickly as your PC can transfer it. So you not only get your output faster, you get your screen back faster. The LaserJet IIIP also has

a new 16 MHz processor and PCL5 for on-the-fly typeface scaling and fast vector graphics. These

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1989-1990

1990-1991

1991-1992

1992-1993

1993-1994

1994-1995

1995-1996

1996-1997

1997-1998

1998-1999

1999-2000

2000-2001

2001-2002

2002-2003

2003-2004

2004-2005

2005-2006

2006-2007

2007-2008

2008-2009

2009-2010

2010-2011

2011-2012

2012-2013

## Tell them about the new LaserJet IIIP



advancements mean this compact printer requires less time to print than many laser printers with higher ppm rates.

For versatility, the LaserJet IIIP has a multisized paper tray that accepts various sizes of paper and envelopes. An optional Adobe® PostScript® cartridge is available. And, of course, the LaserJet IIIP is compatible with all major software and HP LaserJet accessories.

The good looks you get with the newest HP LaserJet look even

better when you consider the price. Just \$1,595.\* For a faxed data sheet, dial (208) 344-4809 from your FAX machine and enter document I.D. number 9601. Now everyone can add a little polish to their work.

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## Super-TCP for Windows Links TCP/IP and OSI Networks

By Ed Scannell

A Windows 3.0-compatible product from Frontier Technologies Inc. promises to let users connect TCP/IP and OSI-compatible networks, and extends users' access to X.400 messaging capabilities.

Super-TCP for Windows is capable of supporting object-oriented file transfers, multi-document electronic mail, network printing, and several Telnet sessions. Optionally available are a Simple Mail Transfer Protocol/X.400 gateway and connections for Sun Network File System (NFS), Telnet VT320/220, and IBM 3270.

The program's file transfer program is designed to speed file transfers and various management tasks. Its look-alike displays of both local and remote file systems, in addition to point-and-shoot capabilities, greatly reduces operational errors, a spokesman said.

Users can send electronic messages in the same way they used paper-based mail, a spokesman explained. The program has paper equivalents, such as distribution lists and public and private mailboxes, to promote electronic messaging.

The Netprint, based on the Berkeley Line Printer, makes it possible for local print jobs to be

printed to several remote sites. It works with the Microsoft Windows Print Manager to print documents.

The program contains a Simple Network Management Protocol (SNMP) agent software, which allows network administrators to manage remote hosts. SNMP allows users to monitor the traffic that remote systems generate and to modify network parameters and tables on remote systems.

Shipping now, Super-TCP for Windows costs \$495.

Frontier Technologies Corp., 10201 N. Port Washington Road, Mequon, WI 53092; (414) 241-4555.

Continued From Page 37

### ANNOUNCED

## Frontier Offers X.25 Bridge for NetWare

Frontier Technologies Corp. has introduced a Novell NetWare-compatible X.25 bridge designed particularly for users of the U.S. government's Defense Data Network. The Super DDN-Bridge for NetWare also supports private or public X.25 networks, the company said. The software will run as a background task on a Windows-based PC on NetWare LANs. Support for any 802.3 Ethernet-based LAN is also provided. The \$6,695 package, including an X.25 network card and software, will begin shipping next month. (414) 241-4555.

\*\*\*  
**Triton Technologies' Co/Session remote control software** will debut this week at Spring Comdex. Version 5.01, scheduled to begin shipping June 1, improves file transfer performance by 8 percent when running text-based applications over a 2,400-bit-per-second (bps) link, and up to 100 percent for EGA or VGA graphics applications running

at 9,600 bps or faster, according to the company. A two-company package lists for \$195. (201) 855-9440.

\*\*\*  
**Artisoft Inc.'s Business Development Group** is now offering free seminars to resellers through the end of next month in major cities across the United States. The seminars will include introductory material and sales training on the LANtastic LAN and other products. (602) 293-6363.

\*\*\*  
**Cabletron Systems Inc.** plans to incorporate Touch Communications' Alliance OSI Management components into all of its communications products. (603) 332-9400.

\*\*\*  
**DigiBoard Inc.'s DigiFax** is a Unix-based hardware and software system offering one or two fax modems and a buffered parallel port on a single communication board for 386-based systems. It supports SCO Unix System V, Release 3.2.X, as well as AT&T SVR 3.2 and other versions of the operating system. Scheduled to begin shipping in mid-August, DigiFax is available in a single-line configuration for \$995 or as a multiline system for \$1,495. The software interfaces directly with word pro-

## Consortium of Vendors Develops SMDS Interface Standard

A group of vendors last week proposed a standard way to connect to Switched Multimegabit Data Service (SMDS) networks that would replace the mess of proprietary solutions.

Members of the consortium include Ungermann-Bass, Digital Link, Venlink, Wellfleet Communications, and Advanced Computer Communications (ACC). Other companies,

including Cisco Systems, are looking at the specifications, said Jayshree Ullal, senior product line manager for internetworking at Ungermann-Bass.

The interface will let users upgrade their existing routers and Data Service Unit/Channel Service Unit products. Partitioning the SMDS functions between the router and the DSU/CSU decreases the cost.

The proposal conforms to Bell Communications Research Inc.'s network management recommendations and consolidates two earlier proposals made separately by two groupings of the consortium's members.

Consortium members expect the SMDS Interest Group to adopt the interface as a standard next month, Ullal said.

— Louise Fickel

# Now PC LANs Can Handle More Traffic With Fewer Modems.

**Our new ACS gives PC LANs dial-in and dial-out capabilities without tying up expensive phone lines and modems.**

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Our Asynchronous Communications Server (ACS) changes all that. By allowing you to support the communication needs of a large number of users with a small number of modems.

Other ACS products claim to provide similar capability, but even those claiming to support dynamic allocation make you dedicate modems to either dial-in or dial-out. Telebit ACS uses a new method of





cessing and other software, and provides HP LaserPrinter emulation. (612) 922-8055.

## SHIPPING

### PhoneNet Connector Ships From Farallon

The PhoneNet StarConnector EN from Farallon Computing Inc. connects a Mac II or Mac LC to a PhoneNet Ethernet network. Designed to integrate with Farallon's StarController EN for building star-topology networks over unshielded twisted-pair (UTP) cable, it sells for \$149. (415) 596-9000.

**Ultinet Development Inc.** is shipping Backman, a backup combination for LAN Manager networks that includes Sytoss Plus and Disk+ OS/2 backup software along with Archive's tape drive and digital audio tape (DAT) backup hardware. Pricing begins at \$3,597 for a 525-megabyte AT-bus system to \$6,727 for a 2.2-gigabyte Micro Channel-bus system. (213) 204-0111.

**MILAN's** new \$329 Altmet media converter lets users connect workstations over UTP without reconfiguring the

AUI port or changing drivers. It is available now. (415) 968-9000.

**Intel Corp.'s** 82593 Ethernet controller allows design engineers to customize their designs by using external logic or application-specific integrated circuits (ASICs). The controller contains only **core Carrier Sense Multiple Access/Collision Detection (CSMA/CD)** functions. It can be used in a wide variety of networking applications, including interconnection to diskless workstations, said company officials. The 82593 Ethernet controller sells for \$18.50 in quantities of 1,000. (800) 548-4725.

## PRICING

### Hayes Offers Two-For-One Adapters

Hayes Microcomputer Products Inc. is making a special two-for-one offer on its new ISDN System Adapter. The \$1,599 device is an external adapter supporting voice and data over local ISDN lines. Through December 31, Hayes will sell users their first two adapters for the price of one, limited to two per site. (404) 840-9200.

## Topic Upgrade Supports Data Retrieval on WANs

BY LOUISE FICKEL

Verity Inc. has announced a version of its document retrieval system that gives users on wide area networks (WANs) better access to data. The new version of Topic 3.0 also gives developers the tools to integrate SQL databases into the system.

Topic 3.0 sports a new user interface, including options for three kinds of queries, sorting, and additional retrieval capabilities. The Topic Sources feature shows users, which document collections, such as a library or the Dow Jones News Retrieval Service, are available.

The optional feature Partition Server allows the Topic

database to be located throughout a wide area network. Topic treats a document database as multiple partitions of data which can be located throughout the network. The Partition Server allows users to expand to enterprise-wide levels and include remote databases in their searches.

Topic's new query language, TopicQL, allows developers to write scripts — rather than C programs — for creating new Topic databases, modifying existing databases, and querying.

The Topic SQL-Gateway connects to the relational database management system server, translates the query into SQL commands, and then returns the

retrieved data for display in the Topic interface.

Topic 3.0 database servers range in price from \$15,600 to \$150,000, depending on the number of users and data sources; they are scheduled to ship in June. Topic 3.0 retrieval clients sell for \$795.

Customers with support and maintenance agreements can upgrade the retrieval client at no cost. However, they will not receive the Partition Server, TopicQL, or the Topic SQL-Gateway, according to a company representative. Pricing varies depending on configuration.

Verity Inc., 1550 Plymouth, Mountain View, CA 94043-1230; (415) 960-7600.

## SoftNet Ships Windows Interface for ShareFax LAN Server

SoftNet Inc. is shipping this month a Windows interface for its ShareFax local area network fax server software, which lets users share a single intelligent fax board across a local area network.

With ShareFax for Windows users can fax documents directly from their workstations, producing the same fonts and

graphics as the original, according to SoftNet president Sterling Wharton.

Based on Alien Computing's Faxit for Windows, the ShareFax package supports Hayes' JT/Fax and Intel's Connection CoProcessor and SatisFaxion boards.

Non-Windows users can share the same fax board and

use a character-based version of the ShareFax application that is included with the \$995 Windows version. It supports an unlimited number of users on a single server. A DOS-only version is available for \$795.

SoftNet Inc., 775 Franklin Road, Suite 101, Marietta, GA 30067; (404) 499-0007.

— David Coursey

allocating a modem for dial-in or dial-out without dedicating it to either function until an actual connection is made.

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## McData Offers Low-Cost Alternative to IBM 3270 Controllers

By DAVID COURNEY

McData Corp.'s new 7100-series network controllers expand upon IBM's capabilities for connecting local area networks, workstations, and terminals to mainframe hosts, offering added capacity at a significant cost advantage over Big Blue products, according to the company.

The 7100-series controllers feature token ring and Ethernet integration, access to multiple hosts, peer-to-peer communications, and the capability to support twice as many devices as comparable IBM systems, said Steve Cartwright, group product manager for McData.

Although replacements for the IBM 3270 cluster controller may seem pedestrian to some, they are playing an increasingly important role in providing mainframe access to network users.

"There are still more than 4 million 3270 terminals being used worldwide," Cartwright said. "But to support the growing variety of terminals, networks, and workstations, the controller must become a more strategic IBM networking tool."

The LinkMaster 7100 Network Controller, announced last week, supports more host connections, device types, protocols, and LANs than IBM's 3174 controllers, Cartwright said.

The 7100-series includes two local and three remote models, ranging in price from \$5,635 for a 16-port single remote host configuration to \$29,935 for a 128-port, single-channel configuration. Prices

increase as hosts and LANs are added.

The 7100-series products will begin shipping June 3, with some features and options to be added late this year and next, Cartwright said.

The products support 4- and 16-megabit-per-second (mbps) token ring LANs. Though IBM doesn't support Ethernet, McData provides the same connectivity for those users as it does for

token ring LANs, Cartwright said.

McData's 7100 series also supports peer-to-peer communications via LU6.2 to route data from one network node to another. The large 7100 model also supports twice as many devices, 128 coax and 34 ASCII, as the large IBM 3174 model.

McData Corp., 310 Interlocken Parkway, Broomfield, CO 80021; (800) 545-5773.

Almost everyone who ends up with a Seiko Instruments high resolution color monitor starts out thinking NEC.

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1024 x 768 Non dot	•	•	•	•
640 x 480 MAC	•	•	•	•
1024 x 768 MAC	•	•	•	•

Seiko Instruments USA Inc., 1000 Riverchase Court, Suite 300, San Jose, CA 95131; (408) 922-5600. NEC and NEC 4000 are trademarks of NEC Electronics, Inc. Trinitron is a registered trademark of Sony Corporation.

## Infonet Builds and Maintains Customized Wide-Area Networks

By YVONNE LEE

A new service from Infonet is among the first to link LANs, and it lets users manage traffic across their wide area networks, according to company officials.

"Our customers are those who would rather buy a worldwide data service than make their own," said product marketing manager Bob Sheikh.

The company will install and maintain custom Infonet WANs, including the router hardware and software. Infonet monitors and fixes problems between the connecting routers, including the leased lines, modems, and Infonet T1 network.

Infonet transmits data, weekly, and monthly network performance reports to the customer and provides them with local telephone support.

Although enterprise traffic travels over the Infonet network, the data is secure, Sheikh said. Infonet adjusts network addressing to prevent outsiders from accessing enterprise traffic. Infonet customer support staff does not have access to LAN traffic, he added.

Infonet supplies the Cisco Systems AGS+ hub routers, which the company manages using Cisco's NetCentral Station SNMP monitoring software.

Infonet-managed virtual private networks support TCP/IP and token ring source routing protocols. The company plans to support Novell Inc.'s IPX, Digital Equipment Corp.'s DECnet, and AppleTalk in early 1992.

Pricing for the service varies according to the number of sites, the speed of transport from sites to the Infonet network, and the location of the sites.

Infonet is available now with speeds from 9.6 kilobits per second up to 2.048 megabits per second.

Infonet, 2100 E. Grand Ave., El Segundo, CA 90245; (213) 335-2600.

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## ENTERPRISE STRATEGIES ■ By Ed FOSTER

# Please Stop Me Before I Kill a Mission-Critical Application Again

It's pretty easy for enterprise computing advocates, such as myself, to get caught up in our enthusiasm for some of these things such as downsizing, client/server architectures, and the like. But perhaps we go too far at

times.

A system manager I've known for several years kindly and gently pointed out one such instance. "You jerk, what do you print that drive for?" said my friend, who we'll call Al. (Al tends to be outspoken, so he never lets me quote him by name. But that's OK, because "drive" is not an exact quote anyway.) "Anybody who takes that seriously is likely to get their butt canned."

In this case, Al was referring to a piece we ran a few months back in the Enterprise Computing supplement in which one author waxed lyrical about the wonderful things that could be done when

downsizing mission-critical applications to run on a PC LAN. It had seemed fairly harmless to me at the time, but Al took great exception to it.

"Putting a real mission-critical application on a LAN is asking for trouble," Al said. "Just think about it. How often does your LAN go down?"

I assured him that how often the LANs at InfoWorld are down has little to do with reality, since we have a lot of people here who abuse equipment intentionally just to see how much punishment it can take. Heck, even one of Michael Miller's stand-alone PCs is capable of doing some serious damage to the Bay Area ecosystem, considering all the strange software he plays with. But I had to acknowledge that, while we are far more careful with our production LANs, they do take the occasional nosedive.

"So, if you were a Fortune 100 company and that happened to an order-entry system that's responsible for a million dollars worth of transactions a day, what do you think those few moments of down time would cost you?" asked Al. In a mission-critical application of that sort, reliability has to be at another level, he said. That's why companies in the fault-tolerant system business have been able to make so much money over the years.

"What we think of as remarkable reliability in the LAN world is totally unacceptable in the kind of professional data center that does real mission-critical work," Al argued. "Down time itself is incredibly costly. And if you lose any data in the bargain, even a stray record or two, you might have to spend millions more just making sure your database hasn't been fatally corrupted."

OK, I relented, there are doubtfully plenty of applications like that out there. And maybe PC LAN technology isn't quite mature enough to handle them just yet. But not everybody needs a Tandem or the like to run their business; PC LANs are capable of doing everything many firms need. I've personally talked to a number of organizations, some of them quite large, that have successfully moved all their applications to PC LANs. I had him there, because Al himself used to work at one of those companies. And at his current place of employment, Al's working on some pretty imposing client/server projects as well, although they do sometimes still use a mainframe or mini on the back end.

Al just chuckled, rather sadistically if you ask me. He never was real fond of his old boss. "Listen, I'm not saying there's not plenty of applications where it makes sense to try your hand at these things," he said. "It's the wave of the future, and all that. You sure gotta have IPX and TCP/IP on your resume these days, believe me. But some of the folks who are putting the crown jewels on these systems are going to live to regret it. Forget about down time; there's a problem that's going to be much bigger than that."

What is that? Al only had a one-word answer. But it's a word we'll have to wait until next time to discuss.

Executive features editor Ed Foster edits the monthly Enterprise Computing supplement. Comments can be sent to InfoWorld or via MCI Mail (efoster).

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The bright color choice for the Macintosh, including the new LC.



## MACINTOSH NEWS

## PIPELINE

## PRICE CUTS

## Apple Cuts Prices Of Memory Boards

In an effort to make the transition to System 7 a little bit easier for customers, Bob Puetter, president of Apple USA, Apple's computer U.S. marketing arm, announced that the prices of Apple's RAM upgrades were being cut by between 50 and 60 percent. Logic board upgrades were also being reduced by between 13 and 41 percent. A price list detailing the changes for particular products had not been released at press time.

E-Machines Inc. has cut the price of its 19-inch, 1,024-by-800-pixel-resolution monitor by \$500 to \$5,495. (503) 646-6699.

## ANNOUNCED

## Adobe PostScript II Printer Is Available

Hardware and Software That Fits has introduced the RealTech Laser, an Adobe PostScript Level II printer with a Weitek RISC processor for the Macintosh. The 9-page-per-minute printer comes with 2 megabytes of RAM and has an introductory list price of \$1,995. It will begin shipping on a limited basis on June 12. (800) 972-3018.

Hayes Microcomputer Products Inc. recently introduced its Smartcom II 3.3 modem software for the Macintosh. The \$149 software is scheduled to start shipping in June. (404) 441-1617.

Storage Dimensions plans to add a 420-megabyte 3 1/2-inch hard disk drive to its MacinStor product line. The company has not yet determined pricing or a shipping date for the product. (408) 879-9330.

## SHIPPING

## Letraset Is Shipping FontStudio 2.0

Letraset is now shipping FontStudio 2.0, a TrueType-compatible font creation and editing product. The software, priced at \$595, is designed to enable users to create hinted PostScript Type 1 and TrueType fonts. (201) 845-6100.

## Claris Unveils Its First Spreadsheet

BY KRISTI COALE

Claris Corp. last week announced its first spreadsheet, a System 7-aware program built on technology first introduced in Wingz and designed to spearhead Claris' drive to become the industry's premier System 7 developer.

Scheduled to ship this summer, Claris Resolve incorporates the Wingz 2.1 spreadsheet engine, which Claris licensed from Informix Software Inc.

The Claris spreadsheet is capable of reading and acting directly upon macro scripts written in Wingz, in addition to scripts that users may create

within Resolve. Moreover, Resolve will work with third-party modules created for use with Wingz.

Built into Resolve are more than 145 functions that allow users to generate financial, statistical, and mathematical models.

Calculations can be done for an entire spreadsheet or for only the cells that are affected by a change in data. Resolve is also intelligent enough to fill subsequent cells for labels as well as for formulas.

A script included with the product enables users to select an entire matrix for calculation, which can distinguish between

— and figure totals for — columns and rows.

Resolve includes 25 chart types that can be viewed in a number of perspectives. The program also has MacDraw-like tools and supports 32-bit color.

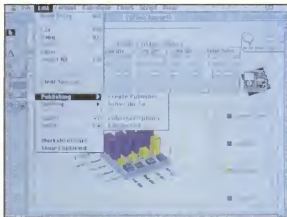
The \$399 spreadsheet takes advantage of all the major features in System 7, but it will also run within 1 megabyte of RAM under System 6.0.5, the company said.

In an aggressive campaign to bring users of competing spreadsheets into its camp, Claris is also offering a "sidegrade" for users of Wingz, Excel, and 1-2-3 spreadsheets for \$99 and proof that they currently own one of those products.

Also in Claris' future plans for System 7 is a new version of MacWrite Pro, while System 7 versions of MacProject II 2.5 and HyperCard 2.1 are currently shipping.

MacWrite Pro is scheduled to start shipping this fall and will list for \$249.

Claris Corp., 5201 Patrick Henry Drive, P.O. Box 58168, Santa Clara, CA 95052; (408) 987-7000.



In addition to taking full advantage of System 7.0's core technologies, Claris Resolve has extensive charting capabilities.

## Apple Will Offer System 7 Support to Prevent It From Becoming Shelfware

BY KRISTI COALE

A funny thing happened to Apple Computer — on the way to System 7 — when a company renowned for foisting customer support off on its resellers realized it would have to offer direct support or see System 7 go the way of OS/2.

Apple decided to offer a beefed-up, direct support program to prevent System 7 from becoming shelfware, said Chris Espinosa, product marketing director.

For users buying System 7 through authorized dealers, and those receiving the software free with a new Mac, support via the Apple System 7 Upgrade Answerline will be free of charge for a specified period.

Those who purchase the Personal Upgrade Kit will have free access to the Answerline for 90 days, and buyers of the Group Upgrade Kit will have 180 days of free support.

The Answerline will have a

technician on hand to answer questions about installation, hardware configuration, compatibility, backup, and general issues. This line operates Monday through Friday, 6 a.m. to 5 p.m. Pacific time.

Users who acquire the upgrade from an on-line service or through a user group may receive direct telephone assistance by calling (900) 535-APPLE for a fee of \$2 per minute.

For corporate users and systems integrators, Apple is implementing a Technical Coordinator Answerline (TCA), a fee-based hotline staffed with engineers to help with configuring, installing, administering, and troubleshooting issues that may arise with System 7.

Access to the TCA will come in two flavors: a one-year unlimited call subscription for \$1,995 and a six-increment call package valid for one year at a cost of \$495. Subscriptions may be ordered starting June 17 by calling (800) 950-2442.

## Director Upgrade Fixes Pauses in Presentations

BY NICO KROHN

A major upgrade to MacroMind Director eliminates the long, vacant pauses in Macintosh presentations that plagued the previous version.

"This is one of the things users have been crying for — because in the past you had to have 8 [megabytes] to load big, rich movies," said Scott Walchek, director of product marketing for MacroMind Inc.

"[Before], you had to load everything in the entire 'movie' into RAM, even if it was at the end of the movie," Walchek said. The Cast On Demand feature in Version 3.0 loads movies off the disk, he added.

In previous releases of Director, the size of presentations was limited to the amount of available RAM. In Director 3.0, presentations are loaded from disk into RAM and dumped out continuously. The same is true for sound, which now will stream continuously from the hard disk.

"Now there may be some smaller, sometimes imperceptible, pauses while it accesses the disk," Walchek said.

Version 3.0, designed for System 7, also gives users two-

## Will It Work With System 7.0?

Part Two

## System 7.0 Aware

Quicken/Press 3.1  
Color Studio 1.5  
Voice Navigator II

## New Versions Needed\*

News Publisher 3.0.1  
Aldus Freehand 3.0  
4d SQL Server 1.0  
SmartCom II 3.2a  
File Maker Pro 1.0 v2  
Dyna File 3.0

## Incompatible Products\*

Ask  
Cursor  
Font/DA Aggr  
Mach Terminal Utility  
Customizer  
File Maker Plus  
FinderKeys

\*SOURCE: APPLE COMPUTER

System 7.0-aware software are promised applications that take advantage of at least some key features of the OS. Compatible software is new or existing software that runs under System 7.0. Incompatible software does not run under System 7.0.

track sound, anti-aliasing, and image-blending, as well as a new paint program.

Director 3.0 is 32-bit clean, and it supports AppleEvents, which allows users to access presentations created with the package from other programs — provided those programs include hooks for accessing Director files. In addition, the upgrade is TrueType compatible, and AppleShare aware, meaning Director files can be accessed over a network.

Version 3.0 lets users add two-track sound to presentations — background music with voice-over, for example — although it isn't possible to mix sound within Director.

Director 3.0 will cost \$995, and current Director users can upgrade for \$195. Those who order Director 2.0 before August 1 will receive a free 3.0 upgrade.

Director 3.0 will run on Macintosh Plus, Classic, SE, SE/30 and LC computers, as well as Mac IIs. System 6.05 or later is required, as is a hard disk drive and 2 megabytes of RAM (4 megabytes are recommended).

MacroMind Inc., 410 Townsend St., Suite 408, San Francisco, CA 94107; (415) 442-0200.





# Contrary To Popular Opinion, Not All Pirates Come With Patches And Peg Legs.

In fact, there's nothing out of the ordinary about people who pirate software. Except for the fact that they're breaking the law. The problem is, most of them aren't aware that it's illegal to make or distribute copies of software without the permission of the copyright holder. And those who are aware often choose to ignore the issue altogether.

If you copy software illegally, you could face disciplinary action from your company, a civil suit, fines up to \$100,000 and possible imprisonment. Which is why we think you should have all the facts. And then help spread the word. To request more information regarding the legal use of software, contact the Software Publishers Association at 1-800-955-7721.

Please send me more information on the legal use of software.

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Please check software format you prefer if you would like to receive SPAudit, a software inventory management tool:  
☐ DOS 3.5\* ☐ DOS 5.25\* ☐ Macintosh\*

Mail to: Piracy Update, 1101 Connecticut Ave., N.W., Suite 901, Washington, DC 20036

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486/25i was awarded the publication's highest honor: Product of the Year. This was the fourth award given to an Elegance 486 system ... no other company comes close!

*PC Magazine* says "Editors' Choice!" When reviewing 486/25 systems, they said "Only one machine stands out ... you could pay less for a 486 system, but not get the bonuses that are offered with the Elegance."††



Digest 486/25i, Sep. 11, 1990  
Digest 486/33i, Feb. 12, 1991

In the February 12, 1990 issue, *PC Magazine* declared Elegance 486/33 Editors' Choice, saying the system was "a sure winner in its class."



*Computer Shopper* readers agree! Elegance 486/25i breezed past the competition and captured a 1990 "Best Buy" award. This makes three years in a row, a Northgate Elegance system was voted

tops by *Computer Shopper* readers.

### ISA 486 System Features:

- \* Intel 486/25 or 33 MHz processor
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- \* 1.2Mb and 1.44Mb floppy drives
- \* 64K SRAM read/write-back cache
- \* ISA bus
- \* One 32-bit, six 16-bit and one 8-bit slots
- \* One parallel and two serial ports
- \* Vertical "Power" case (desktop available)
- \* 16-bit VGA graphics adaptor with 512K video RAM (expandable to 1Mb)
- \* 14" SVGA color monitor
- \* OmniKey®/ULTRA keyboard
- \* MS-DOS 4.01 or 3.3 and GW-BASIC software installed
- \* Microsoft® Windows® 3.0 and mouse
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- \* 200Mb SCSI hard disk
- \* 1.2Mb and 1.44Mb floppy drives
- \* 128K SRAM read/write-back cache
- \* EISA bus
- \* Eight 32-bit EISA slots; six bus master and two slave
- \* One parallel and one serial port
- \* 16-bit VGA graphics adaptor with 512K video RAM (expandable to 1Mb)
- \* 17" SVGA monochrome monitor
- \* Vertical "Power" case
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## INDUSTRY

## PIPELINE

## STOCKS

## Microsoft Approves 3-for-2 Stock Split

Microsoft Corp. recently announced that its board of directors approved a 3-for-2 stock split. Shareholders will receive one additional share for every two shares held on the record date of June 18, 1991. Cash will be paid in lieu of the issuance of any fractional shares. As of May 1, Microsoft had approximately 116 million shares outstanding. Upon completion of the stock split, that number will increase to approximately 174 million shares outstanding.

\*\*\*  
ChipCom Corp. has made its first public offering of 1.5 million shares of common stock at \$12 per share. ChipCom's revenues have grown from \$1 million in 1986 to \$28.4 million last year. Of the 1.5 million shares offered, 1.1 million are being offered by the company; 400,000 shares are being offered by various stockholders in the company.

## PERSONNEL

## Lotus Names Head Of IBG Division

Robert Schechter has been named senior vice president for Lotus' International Business Group. Schechter was formerly senior vice president of finance and operations and CFO for Lotus. In his new position, Schechter replaces Steve Crumney, who after seven years at Lotus is leaving to pursue other interests. Schechter will be responsible for international product development, sales, and marketing. Lotus' president and CEO, Jim Manzi, will assume Schechter's previous responsibilities until a replacement is named.

## ALLIANCES

## DEC, Hyperdesk Agree on ORB

Digital Equipment Corp. and Hyperdesk Corp., a spin-off of General Corp., recently agreed to meld their respective definitions of the Object Request Broker (ORB). ORB will act as the central communication manager in the object-oriented world, linking object types across networks and platforms.

## PRICES

## Dell Computer Price Cuts

Desktop Configurations\*

286 Machines	Old Price	New Price
Dell System 210 with 1MB RAM, 40MB Hard Drive	\$1,799	\$1,599
386 Machines		
Dell System 316SX with 2MB RAM, 40MB Hard Drive	\$2,099	\$1,899
Dell System 325P with 2MB RAM, 60MB Hard Drive	\$2,899	\$2,699
Dell System 333P with 2MB RAM, 60MB Hard Drive	\$3,299	\$3,099
486 Machines		
Dell System 433P with 4MB RAM, 100MB Hard Drive	\$5,199	\$4,299

Laptop Configurations\*\*

286SX Machines	Old Price	New Price
Dell System 334LT with 2MB RAM, 40MB Hard Drive	\$3,399	\$2,799
Dell System 320LT with 2MB RAM, 40MB Hard Drive	\$3,799	\$3,299

\*All desktop configurations listed include one floppy drive and a VGA Color Plus monitor.  
\*\*All laptop configurations listed include 3.5-inch floppy drive.

SOURCE: DELL COMPUTER CORP.

Reacting to recent price cuts by Compaq and IBM, Dell Computer Corp. last week lowered prices on nine desktop and laptop models. The cuts, ranging from \$100 to \$900, are the first in a series of aggressive actions Dell plans for the future, company officials said.

## Xerox Division Accused Of Violating Export Rules

BY MARK BROWNSTEIN

A former employee of the Shugart drive division of Xerox Corp. has filed a complaint with the U.S. Department of Commerce and the FBI, alleging the company violated federal export rules in effect during 1984 and 1985.

Debra von Trapp, an Irvine, California-based consultant who was involved in the recruitment of managers for overseas operations, claims she uncovered evidence that shipments were being diverted to other countries by Xerox during 1984 and 1985.

She further alleges that a West German branch was shipping the drives into Eastern Bloc countries and others where such shipments were prohibited.

Xerox has denied von Trapp's allegations. Calls to Ken Nissy, Xerox's counsel, were not returned by press time.

"We will obviously make an inquiry ourselves to determine the basis of truth or non-truth to the allegations," said Brooks D. Olshon, special agent in charge of the U.S. Department of Commerce Office of Export Enforcement. "It's something we'll take a look at and work [as we normally handle such leads]," he said.

In 1987 von Trapp claims to

have told Dan Starkey, then director of operations for Xerox, about the shipments. Starkey, in an unassigned position at Xerox, could not be reached for comment.

According to von Trapp, she has been and continues to be paid by Xerox, and at one time was required to report all her activities to Starkey. Von Trapp alleges that she has phone bills, check receipts, and other documentation that support her claims that she was a consultant for Xerox and that she was paid to keep quiet.

Further, von Trapp claims to "have many pieces of documentation from the Eastern Bloc." The papers reportedly document [illegal] sales of Shugart drives, von Trapp said.

Von Trapp said she did not report the violations to authorities in 1987 because of threats she alleged were made to her by Starkey.

Olshon hypothesized that if the allegations can be proved, Xerox could be held accountable for shipments made in the past.

"If an existing statute was violated, even if the [export restriction] act was changed, we will have to act on the rules that were in effect at the time [of the violation]," Olshon said.

## INDUSTRY TRENDS

## Software Vendors Lure Users With Discounts

Software Price Cuts Aimed at Competition

BY LISA PICARILLE

While features are considered a strong weapon to wield against competitors, many software developers are also taking aim at their rivals by targeting users' wallets.

Armed with competitive upgrade programs designed to lure users away from their existing software, many developers are offering users a hefty discount on their software for trading in a competitor's package.

Companies such as Lotus Development Corp., Software Publishing Corp., Microsoft Corp., and Borland International Inc. are all using these competitive upgrade programs to get a bigger slice of their rival's pie.

To that end Lotus is selling users heavily discounted versions of their \$495 Ami Pro or Freelance programs — for \$129, and \$99 respectively — if their users trade in a rival program. Microsoft is offering similar deals on its Excel and Word programs. Both programs list for \$495 and can be obtained for \$129. Users can also purchase Borland's Paradox for almost a quarter of the original \$795 list price in a rival database.

SPC is also offering a trade-in

program for users who drop a competitor and standardize on their recently announced Harrow Graphics 3.0 program. "Competitive upgrades can be useful when initially cracking a market that is dominated by a single player like Lotus 1-2-3 or dBase," said Nancy McSharry, an analyst based in International Data Corp.'s Mountain View, California, research office. "They work well in that instance as Borland has demonstrated," she added.

These programs are creative ways to get the attention of users. However, these programs are not useful when trying to protect your own market share, according to McSharry. "When you undercut yourself at too low a price [like a steal], you devalue your own product line," she added.

Most users have invested a lot of time, money, and training into their current suite of applications. "Sure I'd like to be using a Windows word processor right now," said a source at a large New York financial institution. "But I have invested a lot in WordPerfect, and switching to something like Ami Pro just because it's \$49 and end up costing 1,000 times more than that in training alone." □

## Claris Recruits Mathews to Head Development Team

BY LISA PICARILLE

Claris Corp. has recruited Dick Mathews — formerly of Aldus Corp. — to quarterback its product development team, in a move that may signal the kickoff of software development for platforms other than Apple Computer Inc.'s Macintosh.

Mathews, who headed Aldus' engineering division for both Windows and Macintosh products, will begin at Claris next month and report directly to Daniel Eilers, Claris' president and CEO, according to company officials.

Mathews' leadership in managing Aldus' cross-platform products, such as Persuasion and PageMaker, is "very relevant as Claris prepares to extend its products beyond the Macintosh," Eilers said.

The Santa Clara, California-based Claris recently rejoined

Apple as a development arm and is looking to broaden its market with versions of its products for other platforms, such as Microsoft Windows. Existing Macintosh products that are most likely to appear under Windows include the company's drawing and paint package, its flat-file database, and a Windows version of HyperCard, said sources close to the company.

Claris was reportedly very close to bringing out a Windows version of its FileMaker Pro flat-file database last September, when the company was brought back under the Apple umbrella. The FileMaker Pro for Windows project, now in alpha, is expected to receive front-burner status under Mathews. A Windows version of FileMaker Pro is expected to be released at the end of the year, said sources close to both companies.



## TECH STREET ■ BY JOHN GANTZ

## The Third Time's a Charm: DEC Approaches PC Buyers Again



All the hoopla last week over Digital Equipment Corp.'s announcement of an aggressively priced 486-based Intel-supplied PC — under \$6,000, vs. Compaq's \$11,000 486 — would have you believe that Digital is launching a new offensive into the PC market. In fact, the company has been a quiet player for years.

It's understandable that the company has a low profile. When it first entered the market in the early 1980s, it did so with proprietary systems, and it tried to sell them through its own stores. But the market shifted to MS-DOS and to buying through multiline computer retailers, and DEC was unsuccessful as a result.

DEC's second foray into the market, when it started selling Tandy-made PCs several years ago, was better thought out in product development. But DEC made a marketing error when it trumpeted the Tandy alliance as much as it did. The market perceived it as merely another Tandy reseller, when in fact Tandy was building PCs to DEC's specifications. Worse, DEC's sales force rebelled against selling products that they felt were tarnished by the Tandy "Trash 80" image.

So once again DEC maintained a low profile.

Its third entry into the market took place a little more than a year ago, with the introduction of 386-based Tandy-built PCs that run SCO Unix. The multiprocessing version followed last fall. The latter, called the applicationDEC433 MP, can be either a server or a multiuser small-business computer. This time, by targeting small-business users, DEC finally raised its profile. It also managed to turn the sales force's perception of the Tandy role around so it can now say it sells Digital PCs.

PCs per se are still small business at DEC; Dataquest estimates that the company only sold \$200 million worth in 1990. But DEC also makes money selling LANs, software, interface boards, and service and support of large enterprise-wide networks that may be populated with other vendors' PCs. In this context DEC said it made more than \$1 billion from PCs last year.

This latest announcement further raises DEC's profile in the market. The company stands a good chance of moving a lot of systems over the next few years. Here are several reasons:

- DEC probably has the best PC integration scheme of all the major systems vendors.
- Its Pathworks products for both Macs and PCs further add to users' abilities to develop true client/server applications.

- DEC's skills in networking will help it sell PCs.

- The company's growing skill at developing enterprise-wide computing applications that incorporate PCs means that it will be awarded some major bids over the next few years. Now it can add competitively priced PCs to those bids

schedules.

Yes, DEC has added product-line conflict by simultaneously offering Unix-based RISC workstations, 486-based Unix, MS-DOS, and OS/2 PCs; and VMS-based VAX workstations — not to mention overlapping server types. But at this point, the company is willing to risk

some market confusion in exchange for the revenues and account control it can garner by selling competitively priced PCs. If you're downsizing a mainframe application onto LANs and PCs, wouldn't you rather buy your PCs and LANs from your backbone network and server supplier than from a PC super-

store, mail-order catalog, or computer retailer?

So whether it knows it or not, Digital is betting that a fundamental shift is under way in the way PCs are being used. If DEC is right, and I believe it is, that means its profile in the market will continue to increase.

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John Gantz is editor of Tech Street Journal, which covers the high-tech stock market and business performance. The views expressed are his own.

## PERSPECTIVES

Two years ago, Nico Habermann, dean of the school of computer science at Carnegie Mellon University, in Pittsburgh, wanted to make sure its graduates met the needs of the corporations recruiting technical employees from the institution.

So he invited 24 senior-level information systems executives from such firms as Citicorp, Siemens, Hewlett-Packard Co., and IBM to meet once a year on an advisory board which would discuss frankly the preparedness of CMU technical graduates to become information systems professionals — and which would not hesitate to tell him about any shortcomings of the academic program.

"At these meetings we don't try to promote ourselves, or present ourselves in a favorable light," Habermann said. "We try to be very honest, and explain our problems — both financial and organizational. We talk about our relative position in the world, how we compare to other universities, and about the future of computing: anything that is relevant to planning or revising our program in any way."

One area the corporate advisory council has already advised changes in is software engineering, Habermann said. "They convinced us that industry cannot just rely on the bachelor degree recipient in software engineering," Habermann said. "They said that student is simply not well educated enough to take a leading position in industry." What is needed is a program providing graduates with varying levels of expertise and education, the advisors said. As a result, CMU is considering offering a master's degree in software engineering, Habermann said.

Another direct result of the input of the committee is that the school no longer has a single doctoral program in computer science, but has different programs specializing in such subjects as robotics, algorithms, and operations research, Habermann said.

Carnegie Mellon is not alone in wanting a "reality check" on how well it is training technical graduates. Indeed, information technology professionals from around the country are helping the top computer science departments keep their curricula up to date, and at the same time ensuring that the graduates of those programs have the skills and education their future employers think they need.

"Any computer science program is very well advised to have some sort of external advisory group," said Pete Jensen, chairman of the computer science department at the Georgia Institute of Technology, in Atlanta, where such a board plays a fundamental role in shaping the technical education available to students.

"Our advisory council plays an essential role in proposing new curriculum and making sure our graduates meet industry needs," said Evelyn Rozanski, associate director of the school of computer science and information technology, at the Rochester Institute of Technology (RIT), in Rochester, New York. RIT's 20-member board, which met on campus just last month to review the university's new curriculum, includes managers, directors,



## Computer Science Gets a 'Reality Check'

*Universities are turning to corporate IS managers for curriculum advice.*

BY ALICE LAPLANTE

and vice presidents of information systems from large and small companies alike, including Eastman Kodak Co., E.I. DuPont de Nemours & Co., Continental Insurance, and Travelers Insurance.

**SOME BASIC DIFFERENCES.** But academic computer scientists caution that there is almost always going to be a basic disagreement between academic technical types and corporate America. As a result, they warn, the relationship won't always be easy.

"There is always an up side and a down side to these relationships," admitted Georgia Tech's Jensen, who said, as a rule, corporate management isn't on the cutting edge of technology, and is "more interested sometimes in training as opposed to education."

"Universities need to make a careful distinction between educating for the future and training for the past," Jensen said.

"Many businesses are very preoccupied with their own systems languages, their own database formats, their own local environments," said Kenneth R. Kaplan, chairman of the computer science department at Rutgers University, in New Brunswick, New Jersey. "We aren't so concerned with training undergraduates in specific environments, and point out to companies that we want our students to be able to make their way in a broader sort of world."

CMU's Habermann said, however, that he has avoided much of this type of conflict on his advisory council by choosing a "higher level of corporate executive."

"If you talk to the line manager at the corporation — as opposed to a vice president — they want to see more training at the universities, and more practice-oriented education," Habermann said. "But at the higher corporate level, they think more in terms of the longer range payoff."

The University of California at Berkeley is in the process now of seeking representatives from industry to participate in a major revision of the computer science curriculum, said Dave Patterson, chairman of the electrical engineering and computer science department.

"The danger of dealing with industry is that they can take a short-term approach — an approach that won't really serve the student well during the course of a 30- or 40-year career," Patterson said.

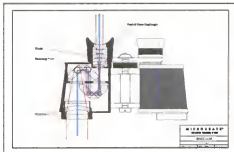
But the danger that industry is obviously afraid of is that a university might offer classes that are intellectually stimulating but don't have a lot of practical relevance, Patterson said.

"I think in both industry and academics there can be facts that seem incredibly important at the time, and if you were to follow each fad, your curriculum would change so dramatically from year to year that your program would have no solidity," Patterson said. "As a result, it's important that corporate requests are tempered by time, to see if the same things that people are asking for in 1985 still make sense for 1990."

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Fig. 2: How an image by two points.



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CMU dean Nico Habermann has relied on his advisory board's frankness.

Another major industry concern is whether the graduates have enough people skills, given that they will probably be working in groups once they graduate, Patterson said. "That is another common complaint," he added. "We hope that the software engineering course will address some of that, since the students will be working in groups of five, having to make meetings come to order, and present their results."

This is also the case at the University of Maryland, in College Park, according to computer science department chairman Satish K. Tripathi.

"Our advisory board has informed us that they wish our graduates had more experience working in groups, but that is a difficult thing to teach in a classroom setting," Tripathi said. "We try to do some of that by assigning class projects, but we're limited in how much of that we can provide."

**IMPORTANT FEEDBACK.** RIT prefers business to have an ongoing relationship with the school, either through recruiting graduates, or participation in a research program, Rozanski said.

The school faculty has responded favorably to a proposal to use "real life" case studies in studying computer science problems — such as those used in graduate business schools around the country — and RIT invites industry people to come in and give guest lectures. "They also wanted to see students graduate more familiar with software tools, such as CASE, expert systems, CAD modeling, and project management products," Rozanski said.

At the University of South Carolina's computer science department, such a committee is just past the planning stage, according to Dr. Manion Matthews, acting chairman of the department. "We're developing graduates for that market, and it is essential to get feedback, and find out what directions they think we should take," Matthews said.

One strong motivating force for universities to more closely involve corporations is that some traditional sources of funding — particularly grants from the Department of Defense (DOD) — are becoming scarcer, said some academicians.

Northwestern University, in Evanston, Illinois, has an advisory board made up of senior executives from Arthur

Andersen, Motorola, Microsoft Corp., IBM, AT&T, and Northern Telecom Inc. Several things prompted the formation of the committee, not the least of which was funding, said Abraham Haddad, chairman of the electrical engineering and computer science department.

"The university community has to be weaned away from DOD funding," Haddad said. "With the cutback in defense, we need to rely on bigger partnerships with corporations."

As a result of the new board Haddad put in place, Northwestern is restructuring its introductory programming courses, using input from a board member and alumni who now works for Microsoft in order to tailor the course to better meet the needs of industry.

"I strongly believe that academics cannot afford to have this ivory tower atmosphere," Haddad said.

**SHIFT TO DESKTOP SYSTEMS.** One area in which the corporate and academic worlds agree is in the downsizing of computer systems. Virtually all computer science departments have moved their students off mainframe and minicomputers, and onto desktop systems.

At Rutgers, most students now work on Sun workstations. "Our upper-division majors are now sitting in front of Sun workstations, and the same thing is true of graduate students. We're pretty much off mainframes," Kaplan said.

At the University of Maryland, students are no longer working on larger computers, according to Tripathi. Students there work on PCs, Sun workstations, and DEC workstations, he said.

The University of California at Santa Barbara "threw out its last large system four years ago," according to Roger Wood, assistant dean of the college of engineering.

**AN INCREASING GAP.** Another notable trend is the shrinking number of students devoted to computer science. Instead, technical departments are finding fewer computer science majors, and more students from other departments — particularly business — taking computer science classes.

"Computer science went through a big boom period, and now it's declining," said William Jennings, vice provost of computing and information technology at Rensselaer Polytechnic Institute, in Troy, New York. Interest in computer science courses is extremely high — and growing — but students these days tend to choose something else as their major, Jennings said.

Northwestern University's computer science department offers a number of joint programs and has turned such programs into a strong point for the school. Students can get joint degrees in computer science and management, for example, said department chairman Haddad.

Carnegie Mellon University has also put together joint programs between various other disciplines and computer science, Habermann said.

At the University of Pennsylvania, in Philadelphia, the computer science department just last year revised its curriculum. One of the most significant changes, according to Norman Badler, chairman of the department, is that computer science undergraduates can now formally declare a "minor" in another subject other than computer science.

"We are not an institute of technology, where everyone is locked up in the

engineering school for four years," he said. "We want our graduates to have a liberal education as well as taking advantage of the technical expertise on campus."

**A NEW PARADIGM NEEDED.** But some technical schools are going much further toward integrating the various disciplines.

The undergraduate computer science curriculum at the Polytechnic University of New York was just revised, based on input from an advisory committee formed by local businesses that recruit students.

"As a result of advice from our committee, we continue to give our students a good grounding in computer science. We have supplemented that with courses in business management, project management, the humanities, and social sciences," said Polytechnic's Ernest Racz. Securities Industry Automated Corp., Brooklyn Union Gas, Morgan Stanley, Texaco, and Manufacturers Hanover Trust are among the firms serving on the committee.

At the graduate level, however, it's a

different story, Racz said. He has put together an advisory committee, but they are finding it much more difficult to move ahead with curriculum planning. Graduates of the masters program are expected to become managers of information technology — not just workers in an IS department — and more is required of them than just a smattering of technical and management skills, he said.

"On the one hand, technology is moving so fast that you have to struggle to just provide the basic knowledge," Racz said. "But at the graduate level, you have to reach further out, and assess both the current and future needs of an organization."

What is the best way to prepare a manager of information systems to organize the enterprise to be of strategic value to a corporation?

Traditionally, information managers are prepared by MBA classes with a few computer science courses thrown in. But, says Racz and others, this is no longer enough. "We need a new paradigm," Racz said. "So far, we haven't found one." □

## University Relationships Give Businesses Early Access to Research

In addition to helping shape the educational path of technical students, corporations are also getting involved in the other product of academic computer science departments: research.

"There are two things that industry wants out of universities — one is students, and the other is research," said Paul McOwen, deputy chairman of the computer science department at the University of Massachusetts at Amherst.

Corporate America's goal is getting a peek at basic research under way in academic computer science laboratories before it can be made into a marketable product.

The payoff of corporate involvement for academic institutions can be large, including money to fund academic research; ideas on new areas for research projects; job placement for graduating students; and possible commercial "spin-off" organizations that license the university's research for commercial products.

The Industrial Affairs program at the University of Massachusetts is typical of such programs, according to McOwen. Participating companies donate \$10,000 or \$20,000, and as a result get early access to graduating students and are given previews of ongoing departmental research.

"Companies get a pipeline to graduates at the same time they derive benefit from new technology at an early stage," McOwen said. Participants in University of Massachusetts' program include Honda, General Electric, GTE, IBM, Digital Equipment Corp., and Texas Instruments Inc., McOwen said.

The way that money received from industrial affiliates differs from traditional research grants is that it is provided as an "unrestricted" gift — which means the university generally decides where to channel the money, according to Miron Livny, associate professor of computer science at the department at the University of Wis-

consin, who also chairs the department's industrial affiliate committee. Industry affiliates of Wisconsin's program include IBM, AT&T, Andersen Consulting, Boeing, IBM, and Kodak. Livny said.

"They can certainly suggest research — indeed we are always looking for interesting technical problems — but they don't specify on which projects the money should be spent." This is an essential point, according to academicians, because it could be a problem for corporations to have too much say over university projects.

"Having industry come into a university program can corrupt the research process," McOwen said. His department came up with a solution: supplement the industry affiliates program with a more pragmatic one.

The university has set up a commercially oriented research institution, steered by university faculty members, called ACSIOM (Applied Computing Systems Institute of Massachusetts Inc.). In that program, technology is licensed by the computer science department for projects with more immediate potential for marketability.

In place for two years now, ACSIOM has already spun off two commercial entities working on products that sprang from joint university-industry research efforts.

"This way we can satisfy industry's need for directed research while keeping our own research pure," McOwen said.

At Cornell University, in Ithaca, New York, participants in an industry affiliate program pay a \$12,000 fee and get access to graduating students as well as early research overviews. Cornell has also recently set up a new program — similar to Massachusetts' ACSIOM — called the Design Research Institute (DRI). Founded in early 1991, the DRI seeks corporate partners for highly practical, directed research, said Paula Dore, assistant secretary of Cornell's industry affiliates program.



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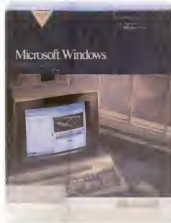
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Internal Data File Damage (i.e. dBASE, Lotus)	10	0	6
Disk Reliability Testing (Number Of Patterns)	80	0	0
System Information (Topics Reported)	94	15	16
NETWORK file recovery <small>*File Save must have been installed prior to data loss.</small>	YES*	NO	NO
WINDOWS Safe Operation	YES	NO	NO
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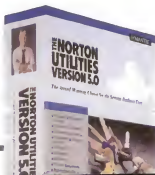
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## Rensselaer Integrates Desktop Systems Into Its Curriculum

At the same time that many computer science departments are seeking input from the business community, institutions specializing in technical education are beginning to integrate computers more completely into their students' lives.

At Rensselaer Polytechnic Institute (RPI), in Troy, New York, computers are seen as so integral to the education of all undergraduate students that high-tech

workstations are being brought into the classroom as well as into the university's dormitories.

"We're implementing a major campus-wide effort to completely integrate modern computing into the undergraduate curriculum," said William C. Jennings, vice provost of computing and information technology at RPI. Jennings said the effort — to be initiated in November 1991 — will better prepare

RPI graduates for the computer-intensive world in their future.

RPI is a technical university, with a total enrollment of 4,500 students, approximately 2,500 of whom are undergraduates. Over 85 percent of its undergraduate population is majoring in science or technology, Jennings said — disciplines that are heavily dependent on computer proficiency.

RPI is outfitting its large lecture halls

and classrooms with workstations hooked to projection systems so that professors can build their lessons around computer applications. RPI is also building computer classrooms — special rooms in which there will be a keyboard for every student. Classes will be held in these facilities when there is an exercise or exam that requires the students to have a computer available in "real time." Workstations will also be available in student dorms, for use in homework and after-hours activities.

At the heart of RPI's program are desktop Unix workstations, chosen, Jennings said, because they provide so much computational power and graphics capability at a relatively low price point. Currently, RPI has 125 workstations installed: a combination of Sun IPC workstations, IBM X-Stations, and IBM RS/6000 workstations. Plans are to have 400 workstations throughout the campus by the start of the fall 1991 semester and over 500 installed a year from now.

Jennings added that the school consciously decided not to go with a single vendor. "We have a commitment to a multivendor environment," Jennings said. "This is not a campus where everyone will use a single platform. Our students need to live in a multivendor world and know there are different options."

**DISMAL DEMOGRAPHICS.** A prime reason for RPI's push for a computer-integrated curriculum is declining enrollment, Jennings said.

"We see declining demographics, with a smaller number of 18-year-olds graduating from high school every year. Hence, the competition to attract very bright young people to science and engineering is intense," Jennings said. "We need to do what we can to differentiate ourselves from other technical universities."

RPI is currently developing a software "strategic toolkit" that will form the core of the RPI curriculum. This toolkit will include a full suite of applications, around which RPI professors will structure their classes, and which will be available on all workstations, both in the classrooms and in the public-access computer laboratories.

The toolkit has yet to be completed, although RPI has chosen its symbolic computation package, called *Maple*, which will focus on teaching RPI's calculus classes. Still to be selected: a numerical computation application, a word processor, spreadsheet, database manager, electronic mail, and CAD application. Faculty members are currently at work selecting the applications, Jennings said.

Starting next fall, all 1,000 entering RPI freshmen will be taught calculus using *Maple*. The lecturers will regularly use the application, and at least one day a week students will have class in one of the computer classrooms. Exams will also be held in the computer classrooms, Jennings said.

Along with installing the workstations, RPI is also performing a major upgrade of its campus networking environment and will look specifically at how to give students remote access to the strategic toolkit, Jennings said.

"Our goal is for our students to be able to sit in their dorm rooms, using a Macintosh, or PC, or whatever their computer of choice, and access the technical toolkit," he said.

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# Windows

## Windows, OS/2 Share the Client/Server Limelight

While Windows Dominates the World of Stand-Alone PCs, OS/2 Still Plays a Crucial Role in the Corporate Network

BY CHRISTINE STRENLO

Virtually no one now disputes the idea that Windows is destined to play a major role as a front end in client/server computing. What is not so clear, however, is how OS/2 is going to factor into the equation and what its relationship with Windows is likely to be.

Those who simply say that Windows has won and OS/2 is dead are focusing on the stand-alone PC market. Certainly, everyone but IBM knows now that Windows is going to be the GUI environment that most stand-alone PCs will be running over the next few years and the platform that attracts the most development of new applications. In the client/server world, however, it is not nearly so clear that OS/2 is dead.

Many large organizations continue to work with OS/2 as the basis of their client/server architecture, both on the client and the server side. Their reasons are numerous, but mostly it comes down to the belief that, for the foreseeable future, OS/2 is more robust than Win-

dows in a network environment.

And don't assume that OS/2 is going to be abandoned commercially, either. Microsoft continues to prepare OS/2 3.0, and IBM has embarked on an energetic campaign for OS/2 2.0. IBM's recent spring campaign to focus the limelight on OS/2 includes an unbundling of OS/2 Extended Edition and the promise of the capability to run Windows 3.0 applications transparently under 32-bit OS/2 2.0, due out this fall. IBM is also stressing the 32-bit version of OS/2 2.0, as well as Presentation Manager, to make it clear that both elements, which are part of IBM's SAA, are rich development environments.

**THE BENEFITS OF MULTITASKING.** Corporate developers take a longer view of OS/2's importance in client/server systems. Bob Holmes, computer technology research analyst for the Southern California Gas Co., in Los Angeles, believes that both DOS- and OS/2-based front ends have a place in the corporate network. Although Windows is currently DOS-based, subsequent versions of Windows will run on OS/2 3.0, he noted. Microsoft is by no means abandoning OS/2, he said.

For now, both users and developers who want to work in Windows are forced to live with the limitations of DOS. For mission-critical, network-based applications, DOS doesn't compare to OS/2's multitasking capabilities, Holmes added. For example, network users who access a host through 3270 emulation from workstations can benefit greatly from OS/2's multitasking capabilities, because they can continue to work in the foreground while they are establishing a host connection and downloading data in the background, he said.

Windows and OS/2 should be viewed as complementary products for the front end, according to Holmes, and while each will find its place in the market, DOS is not a substitute for the more sophisticated capabilities of OS/2. "Do you really want to use a non-preemptive operating system rather than an operating system that is designed to do multitasking from the ground up?" he said.

Holmes' company is in the process of converting 1,500 workstations from character-based DOS front-end applications to OS/2 front ends. The workstations are connected by a token ring network, and the system runs a customer service application that combines local processing and remote access to the corporate



PAUL WATKINSON

mainframe. The conversion is expected to be complete in 1992, he said.

In addition to making users' lives easier, converting entirely to OS/2 will also make life easier for the company's development and support staffs, Holmes said. "Supporting both DOS code and OS/2 code is extra work for our support group," he said. As a development environment OS/2 is more productive because screen updates get priority, and developers can see the effects of changes immediately, regardless of what's going on in the background, he added.

Keith Sievers, vice president and treasurer of Decatur, Illinois-based Federal Kemper Insurance Co. (a subsidiary of Kemper Corp.), said the company is using OS/2 as its primary environment for development and processing of production applications. The company expects to complete before the end of the year an installation of three networks supporting a total of 120 users and 40 to 50 programmers.

Federal Kemper has rewritten its policy regarding information systems to

reflect complete support of OS/2-based workstations, according to Sievers. "We are heavily committed to OS/2 [for several reasons], he said. First, the capability to multitask is essential for developing and using complex applications, as many corporations are doing today. "Windows may be great if you are running a shrink-wrapped spreadsheet, but we are not into shrink-wrap," Sievers said.

Also, OS/2 incorporates communication, network, and database facilities, whereas in the DOS world such resources must be supplied by third parties, which Sievers believes is a disadvantage for customers trying to implement a very complex computing system. "Mixing products makes problem determination difficult," Windows and OS/2 have similar hardware and memory requirements, so he wouldn't be saving resources by using Windows and DOS on the workstations in place of OS/2 and Presentation Manager, Sievers added.

Finally, the graphical user interface of PM, with its link to OS/2, is a boon to

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Robert Bolt, president of Database Server Systems, believes that OS/2 has shortcomings as a server platform.

users on a very basic level, according to Sievers. Using a mouse to enter data requires half the time it would take if users were working with only the keyboard, he estimated.

But it is the link to OS/2 that makes Presentation Manager an essential element for Federal Kemper. OS/2 enables users and developers to run both OS/2 and DOS applications, whereas neither DOS nor Windows can offer a reciprocal advantage of running OS/2 applications. Sievers said. When considering the future, Sievers believes that OS/2-based applications will have a significantly longer life. "We try to get as much life from our applications as we can, and OS/2 is a more strategic choice."

On the other hand John Donahue, senior technical consultant for Amoco Corp., in Chicago, said demand for Windows as a front end cannot be ignored, and the demand for PM front ends may never be as strong as originally forecast. Donahue is part of an 800-person system support staff maintained by Amoco, half of whom are developers designing applications for in-house use. Windows may be the front end of choice for many users at Amoco, though some require the multitasking capabilities of OS/2-based Presentation Manager as a front end, he said. Also, many developers at Amoco are working in OS/2.

Unlike DOS, OS/2 is a robust development environment that provides support features, such as warnings in the event of process failures, Donahue said. We can develop more stable systems in OS/2 as a result, he added. Amoco also uses OS/2 CASE and debugging tools from third-party developers.

In fact, development tools from third parties help Amoco developers design OS/2 applications regardless of front-end considerations, Donahue said. Using Easel Corp.'s Easel compiler, Amoco developers compile application code to run with Presentation Manager or Windows, depending on the user's preference. "Such development tools insulate us from the OS/2-Presentation Manager-Windows issue," he said. When OS/2 3.0 is available from Microsoft, Amoco hopes to take advantage of its API for PM and Windows, he added.

**STIFF COMPETITION.** At present, however, OS/2's commercial competition on the server end is tough: Unix is the prime player, and Novell NetWare and proprietary database servers fill out the lineup.

Unix was developed in the late '60s as a multiuser system and has always been technically and commercially strong in that area. Unix-based versions of Microsoft LAN Manager will help draw Unix into the PC-based LAN market, and versions of LAN Manager/X from Hewlett-Packard Co. and AT&T will help.

Novell Inc.'s NetWare has the biggest share of the network market any way you look at it, and Novell has recently announced support for TCP/IP, the network transport protocols used on Unix-based networks. In addition, Oracle

announced on April 22 Oracle Server for NetWare 386, and Compaq Corp. supported the announcement with performance figures that showed Oracle Server outperforming OS/2 as much as three-fold.

The announcement, as well as the alliance between the two companies, "could really cramp OS/2's style," according to Robert Bolt, president of Database Server Systems, a system integration firm focusing on client/server technology, in San Francisco. The company specializes in database servers and distributed databases.

"OS/2 is in kind of a vicious cycle," Bolt said. "Microsoft has been pushing it to be a server platform, but then it turns out that it's not that great of a server platform. While it's much more powerful than DOS, Unix 386 or NetWare 386 is a better platform right now than OS/2," he said.

It's clear to commercial developers that OS/2 isn't the only server platform out there. Many database products support a wide variety of servers, in addition to or in place of OS/2. Even companies involved in the original development of OS/2's database environment have since

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aligned with the competition. For example, Gupta's SQLBase 3.0 will be available for NetWare 386 and Unix, and in February Gupta and Novell jointly announced SQLWindows for Btrieve.

However, on the commercial side, "There are a lot of great applications out there right now, and most of the companies we deal with are considering Windows as their environment. We have a lot of projects under way using Windows application development tools to develop front ends that run against database servers. The tools are fantastic," Bolt said.

Windows-based development tools for

database management are also numerous, giving Microsoft's own development kit some stiff competition. A buyers' guide produced by DBMS magazine listed 141 such products in a wide variety of categories, including CASE and expert systems. From all appearances Windows seems to be the most exciting thing in personal computing today.

In an effort to join the march toward Windows, Fred Holahan, vice president of product development for DataEase, expects to release a Windows product in late 1991. The fact that other database vendors are already there makes

DataEase want to be there as soon as it can, he said.

However, there are other companies in the same boat, Holahan noted. These include such formidable competition as Borland International Inc., which has not yet released a version of Paradox for Windows. "Our primary competitors also aren't there yet," he said.

Plans for the PM version of DataEase are "on hold for a period of time," Holahan said. "We have to wait and see how the desktop evolves," he explained. "The feeling from Microsoft is that they don't have a problem with OS/2; the

Fred Holahan of DataEase has tabled plans for a PM database, focusing instead on a Windows product.

problem is with Presentation Manager." If Microsoft's objective is to obviate the need for Presentation Manager, Holahan concluded, "we may never go back to our Presentation Manager project."

Holahan wasn't surprised when Microsoft veered from OS/2 to Windows. It didn't take great business acumen to figure out that Microsoft actually intended to "put more momentum behind Windows," he said. "They told us so and we believed it. The winds were changing, and we changed with them."

**WINDOWS' COMMERCIAL SUCCESS.** Meanwhile, a wide variety of developers continue to release Windows-based products that tie to a wide variety of back ends. For example, Channel Computing has released a Windows 3.0 version of Forest & Trees, a free-form database management system that collects data from a variety of computers on a network, organizes the data into a trackable form, and provides reporting and graphing capabilities. Forest & Trees runs on NetWare, LAN Manager, IBM LAN Server, and Banyan Vines networks, and it runs against SQL Server, SQLBase, Oracle SQL, and dBase.

Like many other vendors, Channel Computing recognizes that OS/2 isn't the only server platform out there, whereas Windows may be the only front end in town.

Bolt characterizes the release of Windows 3.0 as a turning point for all of the players involved, not just for Microsoft. While OS/2 and Presentation Manager were languishing, Windows stepped forward and advanced the technology and capability of the graphical user interface, thus building on its own incremental acceptance. Network vendors provided drivers for it, filling a gap left open with previous versions of Windows.

"It really took off as an operating environment, fueling the development of a variety of Windows front-end tools," Bolt said.

"There are more and more front-end tools being released on a weekly basis, which makes the platform more attractive to other vendors, which attracts more front-end vendors. Right now they are a catalyst to each other, the tools coming out and Windows as a platform. That's something we just didn't see with OS/2," Bolt said. As a result, while OS/2's future remains uncertain, Windows seems to have mapped out a clear path to success. □



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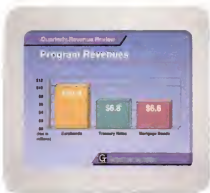
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## NETWORKING STRATEGIES

# Can Windows Keep Pace With Networking Demands?

Microsoft Plans to Offer a Major Upgrade of Windows 3.0 to Adapt to the Shift Toward Networked Environments

BY STUART J. JOHNSTON

**W**indows 3.0 generated a stampede to a PC-based graphical user interface (GUI), but it can't rest on its laurels. Microsoft Corp. must continue to evolve the product to keep pace with the rapid shift to networked environments.

In fact, company executives have repeatedly stated they have a master plan that will take Windows users well into the networked world of the future.

**FIRST, WINDOWS 3.1.** Microsoft intends for that master plan to come to at least partial fruition later this year, when the company expects to roll out its first major upgrade to Windows 3.0.

Version 3.1 will add the capability to automatically re-establish network connections when it reboots. That version will also add True Type support and improved file manager.

Although the company initially intended to release Windows 3.1 by July, that date has slipped, and Microsoft will now only say it will ship this year. Sources familiar with Windows 3.1 say the package is likely to appear no earlier than next fall.

**NETWORK OBJECTS AND DDE.** Much depends on the evolution of Windows' networking capabilities, not the least of which is the concept of compound documents — active documents composed of text, spreadsheets, graphics, and other data all linked or embedded into a single displayed document.

This is beginning to be available already, albeit only on a single PC, using Microsoft's Object Linking and Embed-

ding (OLE) technology. OLE provides the capability to simply link complex data created in one application to a data representation, such as a chart, in another. It also enables users to embed data, which includes information as to what

program created it, into a compound document. In embedding, if the user wishes to change the data, double clicking the mouse will invoke the creator program on the spot.

OLE support is also scheduled to ship with Windows 3.1, but is available in a few products today — notably Microsoft Excel 3.0 and Lotus Notes 2.0. Both companies participated in creating OLE.

However, while OLE can actually be used over a network today, the user needs to know the exact path to the file containing the necessary data. And we be to that user if someone else moves the file to a different directory or deletes it altogether.

Several elements are necessary in order to enable OLE over networks — and, while the current stand-alone version uses DDE under Windows, Microsoft officials have said future evolutions may use some other underlying transport protocol. Sources have said that 3.1 will not include Network Dynamic Data Exchange (Net DDE). (See "Delayed Win 3.1 Will Lack Net DDE," February 25, 1991, Page 1.) Although Microsoft never announced that Net DDE would be a feature of 3.1, corporate buyers said they had initially been told that it would be included. Such functionality is needed, however, for

Microsoft to implement OLE over networks.

As Windows itself moves to other platforms, the issues involved in implementing an OLE standard expand exponentially. Although OS/2 supports DDE, for instance, there remain issues of network interoperability with Unix platforms, which are evolving standards of their own.

An important element of cross-platform interoperability for OLE may be the Object Management Group's (OMG) proposed Object Request Broker (ORB). Composed of 120 companies, including many Unix vendors, the OMG may prove to be extremely influential when it chooses this summer a standard for information "objects" that can be used by systems on compliant networks. Unix International, a major Unix standards organization, recently said it would support OMG's pending ORB choice.

What this means in practical terms is that divergent systems will be capable of transparently sharing and exchanging data and have interoperable applications — e.g., compound documents — as long as they support the ORB and other OMG-promulgated standards.

Microsoft, in fact, recently joined the organization, although company officials

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have not publicly committed to adopting whichever ORB standard the OMG chooses for the standard.

While the fact that Microsoft joined the OMG is a positive step, the company's hesitation worries some industry watchers. A standard that is not endorsed by the strongest PC software firm does no good for PCs users, they say.

**WIN-32 AND 'ADVANCED WINDOWS.'** Two additional technologies also set to make their debuts this year will undoubtedly have a profound effect on Windows and, by extension, network users. However, both will only be available as developers' kits initially.

One of these is a 32-bit applications programming interface (API) for Windows called Windows-32 — or just "Win-32." This is not a separate version of Windows per se, although obviously a 32-bit version of Windows will be one manifestation of the API, company executives said.

In fact, the Win-32 API will be implemented to run on top of either DOS or an upcoming version of OS/2 — variously called Version 3.0 and Portable OS/2.

Among the new APIs to be introduced with Win-32 will be calls to provide access to a set of "generic" network services, such as E-mail or security.

OS/2 3.0, which will also ship in pre-release versions to developers this year, is based on the New Technology (NT) kernel. The NT kernel contains a core set of operating system functions, including multitasking and multithreaded execution.

NT is set up much like a child's Lego set — it can support multiple file systems and APIs. It will be capable of running DOS, 16- and 32-bit Windows, Posix, and OS/2 programs, Microsoft said.

However, it leaves the decision of what kind of programs to run up to the user. If, as many people believe, the user chooses to run only DOS and Windows programs, the OS/2 API set will not be loaded at all.

Therefore, while Microsoft officials say it is only a concept, they have promulgated the concept of the NT kernel running the DOS and Windows APIs as "Advanced Windows."

NT is written in the C programming language and is designed to be portable to other processor architectures — notably the MIPS R4000 chip set that was recently endorsed as a future RISC standard by the Advanced Computing Environment (ACE) initiative group. (See "Users Hail Proposed RISC Standard," April 15, Page 1.)

By making a switch on the Microsoft C compiler that will ship with OS/2 3.0, developers will be able to generate code to run on either the Intel or MIPS chips.

Microsoft has yet to fulfill this promise, though, and while developers' kits are due to ship this year, the first hardware and software systems are not expected to arrive on users' desktops until the second half of 1992.

A major impact of ACE, therefore, will be closer communications and interoperability between PCs and workstations.

**TRULY DISTRIBUTED SYSTEMS.** Concomitant with these other changes will be another

evolutionary track that is equally important; it begins with Windows 3.1's simple network additions.

These plans include developing for a world of truly distributed operating environments. In this part of the picture, APIs for various network functions migrate into to the user's local operating system and

**The first hardware and software are not expected to arrive until the second half of 1992.**

become a generic calling interface for programs that need various network services.

Ostensibly, many of these will begin to appear with the advent of the 32-bit Windows API.

Included are APIs for mail systems, security, distributed directory services, network backup and restore capabilities, and remote system administration, which will all — to some extent — become local to each user's system.

By coupling together all users' local network service components, a truly distributed operating environment will be ultimately achieved. For instance, intercoupling each user's local security module will produce a total, networkwide security system that purportedly will be

more secure than one built directly into the network operating system.

In such a world, users and software are expected to evolve beyond today's client/server computing to one in which clients and servers become "virtual."

For instance, data on several machines in a network might, at one point in time, become a single "virtual server" that provides data to a user's program requesting information. At a different time, those machines might act as clients to a large database running on a minicomputer.

One key component necessary for this evolution is the shift to distributed network directory services.

Eventually, with the release several years from now of what Microsoft chairman Bill Gates calls "Next Generation" Windows, most of these changes will be in place, as will the evolution to a truly "object-oriented" operating system.

At that point, users will work in a computing environment in which they do not have to be as conscious of what application they are currently running — because, no matter where they are, they will use whichever tool is most appropriate to the task.

They will also, according to the plans, have access to data they need — as if it were located on their own local machines — without regard for where on the network it actually resides, and will receive automatic updates if the data changes, should they desire them.

Network administration will also be much easier, with remote updates of systems and applications software, and even installation of new file systems, performed over the network. □

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## TECH UPDATE

# Windows, OS/2 Debate Is Still a Hot Topic

Software Vendors With Limited Resources Are Still Forced to Choose Between Windows and OS/2 Development

BY BRETT GLASS

Developers of graphical user interface software for IBM PC compatibles have never had an easy time choosing a platform, but the confusion has never been greater than it is now. Will Windows maintain its dominance when OS/2 2.0 arrives? What about OS/2 3.0?

In 1989, before the announcement of Windows 3.0, Windows and OS/2 Presentation Manager appeared to have nearly equal future market potential. At 1989's fall Comdex, IBM and Microsoft issued their now-famous "statement of direction," aimed in part at developers struggling with the choice between Windows and OS/2. Software developers who are targeting both environments, other than those with Windows projects under way, are recommended to start with OS/2, Microsoft and IBM executives said.

As it turned out, no advice could have been worse. OS/2 has languished, stigmatized by a misleading name (millions still think it runs only on the PS/2), poor DOS compatibility, a high price tag, and a dearth of applications; only 300,000 copies have sold to date. Meanwhile, Windows 3.0, released last May, sold 3 million copies and became an overnight success. Many independent software developers who had originally targeted OS/2 had to play catch up. What's more, seeing which way the wind was blowing, Microsoft lost much of its enthusiasm for OS/2 and began exhorting developers to develop for Windows exclusively.

**THE BATTLE HEAT OVER.** In an announcement this April, IBM stated that it is releasing a 32-bit version of OS/2, called OS/2 2.0, which will be "a better DOS than DOS and a better Windows than Windows."

According to IBM, OS/2 2.0 will run DOS, Windows, and 16- and 32-bit OS/2 applications concurrently. Given the right conditions — a reasonable selling price, a new name, more built-in applications, and the capability of multitasking DOS applications more reliably than Windows — OS/2 2.0 could reverse the trend again.

What's a developer to do? If you're writing software for sale, your decision can make or break your business. But even if you're doing in-house development, you'll want to avoid rewriting your code if a new GUI becomes popular. And if some users stick with the less popular system, you'll want to support them as well. In any event, you'll want to hedge your bets, making sure your code will run on as many platforms as possible.

For those who want to adhere to such a strategy, there's good news and bad news. The good news is that there will soon be several sets of tools which will either allow you to "straddle the fence" (write code which will run under Windows or any version of OS/2) or will permit users to run unconverted Windows binaries under OS/2. The bad news is that if you follow IBM and Microsoft's advice, you'll still have to recode.

The only solutions to allow you to span all the Windows and OS/2 plat-

forms, require you to write your code for Windows first.

**CONVERSION KITS.** Both Microsoft and IBM intend to provide "conversion kits" that allow Windows code to be ported to OS/2 with little or no effort. The reason conversion is important is that 16-bit machines — as in the millions of 286-based machines installed — won't run OS/2 2.0.

Microsoft's effort, which is known variously by the names "Porthole," the Windows to OS/2 Software Migration Kit, and most recently Windows Libraries for OS/2 (WLO), is the first publicly available toolkit which allows code written for Protected mode Windows to be quickly ported to 16-bit OS/2 (that is, OS/2 1.X) with few changes. Based in

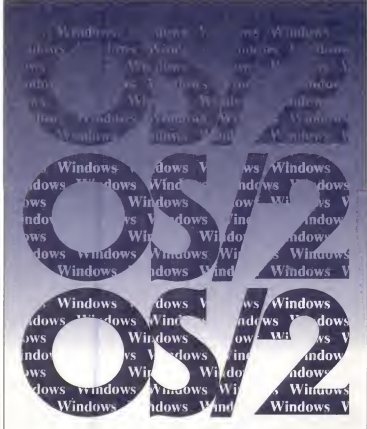
**M**icrosoft has promised to end the OS/2 vs. Windows dilemma once and for all in OS/2 3.0.

part on Micrograph's "Mirrors" technology, which the Richardson, Texas, company developed in house to solve the same problem, WLO replaces the run-time libraries of the Microsoft C compiler with versions that will not cause problems with OS/2, and adds corresponding DLLs (Dynamic Link Libraries) to OS/2 to allow it to emulate Windows. The currently shipping version of WLO, 0.9, requires ISVs to distribute two binaries for each application: one for Windows and one that's been specially prepared for OS/2. However, a forthcoming version, 1.0, will allow the same binary to be used under both.

WLO has some drawbacks, however. First of all, it is not clear whether WLO will work with many languages or compilers besides Microsoft C. We called several vendors, including Zortech and The Watcom Group, to ask if they knew for sure whether their C++ and C compilers will work with WLO; neither had tried. (Both were optimistic, however, because their compilers are compatible with Microsoft's run-time libraries.) Microsoft also believes that these compilers will work with WLO, though they have not performed extensive tests.

On the other hand, WLO may not be so easy to use with languages other than C and C++. When we attempted to use a beta version of WLO 1.0 with Borland's Turbo Pascal for Windows and Stony Brook Modula-2, our programs crashed due to software interrupt instructions in the run-time libraries. This means that the libraries before WLO can be used with their products.

Another consideration is performance. Applications converted with



WLO typically suffer 10 to 15 percent performance degradation; much more if they spend a great deal of time doing certain kinds of operations. If speed is an issue in your application category, this may rule out using WLO.

Finally, WLO doesn't support all Windows functions. The WLO documentation lists a full page of calls — including sound, global memory allocation, and graphics functions — which can't be used in a WLO application. This may crank programmers' style or force them to rewrite code.

Meanwhile, IBM — not to be outdone in the speed department — recently announced that it has contracted with Micrograph to develop a "high performance Windows porting layer" — a conversion kit similar to, but better than, WLO. Micrograph intends to rewrite portions of Presentation Manager to enhance its capability to perform Windows functions quickly. The result will be converted applications that run faster under OS/2 2.0 than they do under Windows — as much as 20 percent faster, according to George Grayson, Micrograph's president. Micrograph also claims that its conversion kit will support faster Windows functions without a pageful of exceptions. Other porting tools will include a conversion kit for Windows device drivers, as well as aids to help programmers write native OS/2 and Presentation Manager device drivers. All of the toolkits will be available directly from IBM, not through Micrograph, according to Grayson.

**WINDOWS BOXES.** In April of 1990, Microsoft vice president Steve Ballmer demonstrated a facility that allowed OS/2 2.0 to run native Windows applications in a "virtual Windows machine" — just as it can run DOS applications in a "DOS virtual machine." Microsoft appeared to lose interest in this project after Windows took off; however, IBM, with its continued strong interest in OS/2, has recently picked up the ball. Again teaming up with Micrograph, IBM has promised to beef up this facility with special code built directly into PM. However, since OS/2 2.0 will only run on 32-bit machines, you'll still have to use WLO if you want to run your Windows application on 286 systems with OS/2 1.X.

There's also another "Windows Box" on the horizon, though it's likely to be a long time before it actually ships. Microsoft has promised to end the OS/2 vs. Windows dilemma once and for all in OS/2 3.0. In that iteration several APIs — Windows, Windows-32 (32-bit Windows), 16-bit OS/2, and 32-bit OS/2 — are all supported by the underlying "NT" kernel. However, OS/2 3.0 is likely to be at least a few years in coming, and the winds could shift yet again during that time.

While different developers may choose different routes to the goal, one thing becomes clear: despite the cryptic documentation and awkward programmer-hostile interface, the only choice for the developer who wants to hedge his bets is to write his code for Windows, then hope for the best. □

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## FRONT ENDS

# Windows Front Ends Tame Mainframe Data Access

IS Managers Attempt to Bring More Information From Their Mainframes, While Keeping Control of Corporate Data

BY JOEL MARDESICH

Accessing data from the corporate host mainframe or minicomputer can be like walking into the hallowed halls of the ancient Alexandrian Library — you don't know where the information you want is stored, and you don't speak Greek.

IS managers are attempting to ease the process of accessing important data by using Windows as a front end to the host. The addition of Windows applications to the information systems landscape adds a librarian to the scene — one who is not only intelligent, but attractive.

Windows-to-host applications promise users access to the data they need without having to navigate through an unfamiliar host language and without requiring them to wait until a trained operator can find the time to retrieve the data. Many IS managers are striving to implement systems in which users can click on an icon and get logged into a host session, or click on an icon that represents the type of data they need, and go straight to that data.

Of course, it's not that simple — you can't just install a Windows terminal emulator and suddenly get shelter from the host commands. But even plain vanilla Windows terminal emulators let users run a host session in a window, and use the Windows clipboard to cut and paste the data into a spreadsheet and create a graphical representation of the data.

Most terminal emulation packages, such as Redmond, Washington-based Wall Data Inc.'s Rumba, or Houston-based FutureSoft Engineering Inc.'s DynaComm Elite, further simplify the process with the inclusion of scripting capabilities that allow users to automate tasks. These tools will help users move beyond the concept of traditional terminal emulation. Instead of looking at the host the same as you would from a terminal, there's the possibility of creating macros that log you in, transfer files, and other tasks. Rumba has a feature called Quickstep that allows users to assign macros to buttons on the graphical keypad.

According to their creators, Windows adds a nice face to those programs' automated capabilities. "Using a PC as a terminal emulator is fine, but you can also use Windows to mask the complexities of the mainframe from the user," said John Wall, vice president and founder of Wall Data.

Windows-to-host access is still relatively new, and as such, many users are still in the beginning stages, creating prototypes of the systems they want to implement.

**WINDOWS PILOT PROGRAM.** At C and S Sovran Bank in Atlanta, end-user consultant Marty Hicks is developing a pilot program to give users easier access to the company's mainframes. "We want to create user-friendly screens that will also talk DDE [Dynamic Data Exchange] to our terminal emulator."

The aim is to create applications that will bring information down from the mainframe, but display the informa-



PAM WATTENMAKER

tion in a more user-friendly PC environment. "We don't even want [them] to know that a 3270 emulator is running," Hicks said. "As far as they're concerned, they're in an Excel screen or a Word screen. Short of being prompted for the password, that's all we care about — we don't need to know we're logging into the TSO Nomad in Norfolk or the TSO Atlanta mainframe to get information. As long as they know the proper password or log-on sequence, they don't have to be system engineers to access the data."

Hicks is using Word for Windows as a front end and creating four different sessions running in the background that log into different hosts — electronic mail systems in Atlanta and in Norfolk, Virginia, and a TSO session in each location.

"We've created dummy data under Nomad, gathered that data, brought it down, and massaged it under Word using macros to create screens under Word," Hicks said. "We actually send it up and have data changed on a mainframe."

Hicks used this test procedure to eval-

uate emulation products and has decided on Irma Workstation for Windows, from Digital Communications Associates of Atlanta. Being able to use the host data within regular Windows applications will greatly enhance user productivity, Hicks said. Information on the host database is hard to decipher.

"When you pull this information up on a customer from the mainframe, it's not in any formatted order," Hicks said. "They have several fields running together, and they have to know how that information is divided up. It's a time-consuming matter to go through and search the data. We just want to log in and have the information."

Though Irma Workstation for Windows gives Hicks the tools to get information off the mainframe, he still needs a front end. One of the stumbling blocks he faces is the lack of a standard for DDE. "Word DDE verbs are different from the Irma Workstation for Windows DDE verbs. You really have to learn two different scripting languages to take advantages of this."

Now that Hicks has proved his pilot can work, other departments at the bank will test it further and implement it. "It's a neat idea right now," Hicks said. "How much we're going to save in time and money remains to be seen."

**PROJECT EASE OF USE.** After embarking on "Project Ease of Use," wherein every user would get Windows 3.0 and Windows applications at their desks, Arco Products Co. decided to go a step further and started a pilot that would bring valuable process control information about its refineries to many more people than currently can see it.

A Windows-based display system being developed for Arco by Automated Design Systems, a systems integrator based in Atlanta, promises to do this. Users with the correct access rights throughout the company will be able to view data from Arco's Honeywell TDC 3000 minicomputers and DEC VAXes, which are used to run the refineries in Los Angeles and Cherry Point, Washington. Right now the data is accessible only from

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an X terminal in a control room at each location. If all goes according to plan, users will be able to view the refinery process and see representations of the machinery involved, along with vats of fluids, their temperatures and pressures, and other information at their desktop, said Roozbeh Hamouni, system development manager at the company's Los Angeles refinery.

The project will not replace the host systems — just give users access to the data more easily. The TDC 3000 is very sophisticated — all the refinery instruments are connected to it. It monitors the

instruments and sounds alarms if a temperature goes too high or a pressure drops too low. Once the information flows through the TDC 3000 and into the DEC hosts, that information is disseminated to users.

"The whole idea is to have some sort of history for these guys to do trending," Hamouni said. "Right now if someone asks for information about a unit, they have to go through data sitting on the DEC. It gets downloaded to a Focus database. In some cases, where they prepare the morning report, they go through the first two hours of handwrit-

ing these reports and doing calculations.

"We're hoping we can automate a great deal, so these guys can create the reports they want. We want to provide the easy-to-use tools necessary for [them] to get to the data they want without knowing where it is residing," he said.

The potential number of users accessing the information in the system is 200 to 1,000, "depending on how many people will be interested in this information," Hamouni said.

**A GRAPHICAL VIEW.** Users will be able to graphically view the refinery's machin-

ery, as well as materials being used to create whatever product is being made at that time. "The TDC3000 process information system gathers 'process points' from various instruments attached to it, up to 15,000 points per minute. These 'points' include pressure, temperature, rate of flow, and other information from different units in the refinery."

At the Los Angeles refinery, data goes into DEC 3400s, and then to a DEC 6510 back end. Engineers, operations, and refinery management staff track that information, to see histories of how each unit is performing, what materials are being used, how much is being produced, and so on.

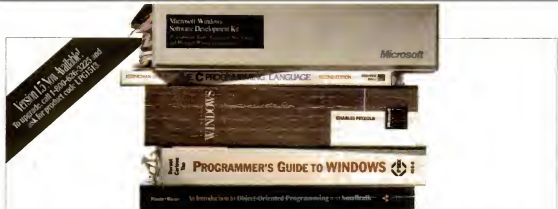
Currently, the only way to see the process control information at Arco is on a DECStation. "You have to have DECnet, a DEC workstation with X Window, and that's highly specialized," Hamouni said. "Since we made the decision of moving into the Windows environment last year, we started this project called Ease of Use, putting Windows 3.0 on everybody's desks. The next step is to provide information on the desktop, so they can utilize the Windows' capability in terms of using Excel and Word for Windows."

Part of the system is a trend package that will allow users to analyze the process. The system is still in the prototype stage, but all is going well, Hamouni said. The first phase of the program is to get information out of the DEC. Eventually, Hamouni plans to incorporate the DB2 database into the system.

The proposed system could stir up some politics at Arco, because employees aren't used to having access to this kind of data. "There's some question whether anybody should be able to look at the process," Hamouni said. "There's security on [Microsoft] SQL Server. But this is a brand-new capability. We've never had process information available to anybody."

"This is a very touchy situation. You're talking about blowing up a refinery if you set the points wrong," Hamouni said. "We don't want that [capability] to be at the fingertips of anyone in the refinery."

For now, Arco continues to use host power and security to get critical work done. But the capability to have access to that data on the users' desktops will greatly enhance users' productivity, Hamouni believes.



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At C and S Sovran Bank, in Atlanta, Marty Hicks uses Windows to hide the 3270 terminal emulator interface.

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**ACCESSING REAL-TIME DATA.** For Quotron Systems Inc., Windows is an important part of the company's plans, because the Windows-based software being developed by Mohsen Farry and his group, Quotron's presentation software group, acts as a front end to TCP/IP hosts and NetWare servers.

The Marina Del Rey, California, subsidiary of Citicorp used Windows to create a more user-friendly version of its market data retrieval software. Quotron's customers are stockbrokers, bankers, and others who need real-time updates to market data from Wall Street and other

exchanges. And they need to integrate that data more easily with other applications.

"These applications allow them to manage customers' accounts, do analysis of market data, and then incorporate all the real-time market data into spreadsheets or word processors on the fly," Farry said. "They could write a letter to a customer and get real-time market data into it."

Farry last year began a quest for user-interface alternatives. "We began looking into alternative user interfaces that brokers will find more friendly. We wanted

to go between applications very fast—even clicks of a mouse are not acceptable. Going between applications should be fast, single keystrokes," Farry said.

Windows' user-friendly interface was less important to Farry than the operating environment's capability to multitask. "We decided to go with Windows as our multitasking environment," Farry said. "The graphical user interface was secondary."

The DOS version of Quotron's system currently includes terminal emulation software developed by the company that allows background processing. In developing a Windows version the emulation feature was essential to its users who had to have real-time access to market and financial data. Another major requirement was to support financial character sets and fonts.

Quotron also needed software that would allow access to TCP/IP hosts, as well as allow multiple simultaneous sessions. These sessions could be accessing

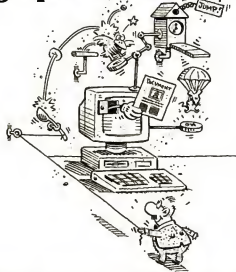
the TCP/IP host, or Novell NetWare or Microsoft LAN Manager servers.

A major component of Quotron's system is Novell's LAN Workplace, which allows users to run TCP/IP and IPX protocol stacks on the same network interface card. Farry's group developed its own terminal emulators that run under Windows using toolkits from Microsoft and Novell.

The product includes terminal emulation, as well as applications that run on the servers and PCs in a client/server fashion. "We needed the ability to use off-the-shelf applications and feed them real-time market data," Farry said. Quotron's users are close to getting what they asked for.

Getting these applications out of the prototype stage will take some time. It may be another year before these systems integrators and consultants see the real fruits of their labors. But the promise of using Windows as a front end to hosts for gathering data is alluring. □

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Windows multitasking capabilities took precedence over its graphical interface for Quotron Systems' Mohsen Farry, who needed to implement background processing.

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# WordPerfect for Windows is just around the corner, but sales projections are all over the map.



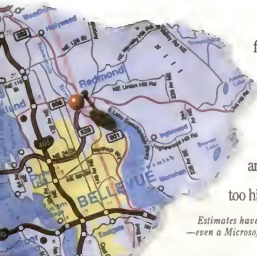
Thanks to everyone who called in with their estimates to help us calculate first-month sales projections for the soon-to-be-released WordPerfect® for Windows. You called in by the thousands, from near and far, from just down the road in Pleasant Grove, Utah, and from across the Pacific in Honolulu, Hawaii.

WordPerfect watchers in Tallahassee and Toronto have entered our contest to win \$25,000, which we'll pay to the one whose estimate comes closest to the actual orders for WordPerfect for Windows in its first 30 days on the market. And while we don't yet know who the winner will be, what we have learned is you're an enthusiastic bunch, you believe in our product, and you come in every variety.

Even a Microsoft employee called to enter the contest, estimating that WordPerfect for Windows will sell 80,000 copies in its first 30 days (we're flattered, since that's about twice what Microsoft's Winword® sells right now).

And three very gracious nuns in upstate New York called in and estimated a whopping 1,300,000 copies—hoping to use the winnings to benefit their spiritual center. But an equally inspired user, Reverend Father Michael Barclay, would say their estimate is a little too high. He puts first-month sales at 738,542. On the other hand, according to contestants at

*Estimates have come in from just about everywhere, and from just about everyone—even a Microsoft employee in Redmond, Washington.*



Three New York nuns are hoping to use the winnings to benefit their spiritual center.



Miller Brewing Company, Walt Disney World, the United

Nations, NASA, American Express and the Internal Revenue Service, both estimates are way off. So who is most likely to be right? Even industry "insiders" don't agree. Esther Dyson, publisher of *Release 1.0*, puts it at 80,000 units the first month. Research consultant Tim Bajarin says 70,000. And Wohl & Associates' Amy Wohl, even more optimistic, figures WordPerfect for Windows will hit 126,000 the first month.

Equally fascinating was how some of you arrived at your

figures. One incredibly scientific approach was faxed to us by Hakki Öcal of Woodbridge, Virginia. He figured his estimate of 484,000 by calculating  $1/8$  of  $\{X_2\%(3,000,000)\}$  (where  $X_2\%$  is  $\{100(Y/600,000)\}/3,000,000$ , where  $Y$  is the number of DOS/WP owners). *Wheuu*. On the other end of the spectrum, Charles Havekost said his estimate of 261,381 "just came to me" at a Grateful Dead concert. All we can say is, good luck to both.

So here's how the numbers added up:

Low: 0	Average: 640,955
High: 910,620,044	Median: 218,124

Some people put in all-nighters coming up with sales estimates for WordPerfect for Windows.

Contestants said they used everything from Ouija boards to Social Security numbers to arrive at their figures.



We appreciate all your entries and the enthusiastic anticipation of WordPerfect for Windows (Steven Boucher of Las Vegas actually said he's "drooling"). And although we're not as optimistic as some of you, Clive Winn, our Vice President of Marketing, has taken your estimates to heart. He'll be ready on the release date with 50,000 copies, and will have an additional 100,000 available within the first month. But remember, since the contest includes all *orders*, it's still anyone's guess.

We think the new WordPerfect for Windows will make all our customers winners in a sense, however. Because as Joel Leenaars of Richmond, California, put it, "Windows won't be a standard for me until WordPerfect for Windows comes out."

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## PRODUCT COMPARISON



# One-Upping Windows File Manager

Third-party vendors of file management utilities vie to fill in Windows' file management performance gaps with a plethora of features.

BY BRIAN LIVINGSTON REVIEW BOARD

The category of graphical file managers barely existed in the DOS marketplace prior to the introduction of Microsoft Windows 3.0. But with the success of Microsoft's icon-based environment, and the drag-and-drop file management style that became available using the File Manager bundled with Windows, many new utilities have emerged that use a graphical approach.

Since the Windows File Manager is included free with every copy of the environment, you might think there would be little need for third-party utilities in this area. But by our count, there are at least nine different packages vying to replace File Manager as your favorite file management utility.

In part, this is due to complaints by many users that the Windows File Manager is much slower when changing from one drive to another than were the DOS character-based file management utilities. (For a comparison of eight such DOS shells, see "Giving DOS a New Face," April 16, 1990, Page 57.) The File Manager requires several seconds to read the directory structure of a disk every time a different drive letter is selected for viewing. This information is not saved, so each drive is re-read every time it is selected for viewing. Other products in this review handle disk reads by saving the directory information, so it doesn't need to be read every time you change drives.

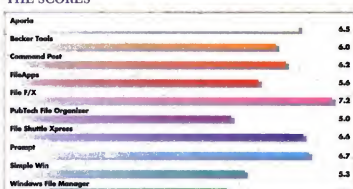
**ENHANCED CAPABILITIES.** For many purposes, the File Manager may already provide all the features you need. If you need performance, you can dramatically speed up File Manager by recording a 10-

keystroke macro with the Recorder application, then playing back this macro every time you start Windows. (See "How to Make File Manager Five Times Faster," Page S95.) And for times that you need real speed in graphical file management, you can also use the other file manager included with Windows, the MS-DOS Executive. Although the Executive has no drag-and-drop mouse features, it reads disks and directories almost instantly and can handle most Copy, Move, and Delete functions. The Executive was a standard feature of Windows 2.x, but became an undocumented feature when Windows 3.0 was introduced. To use it you must run the program MSDOS.EXE — no icon appears in the Windows Program Manager.

But for capabilities beyond simple file manipulation, you may find that one of the utilities reviewed here has the extra features you need. Some of these packages offer the capability to search for and manipulate files that contain certain text strings, for example. Others allow you to define your own icons or pull-down menu items; compress or encrypt files; transfer files between computers; and view files in such formats as text, graphics, and spreadsheet.

The products reviewed are Aporia by NewTools Inc.; Becker Tools, distributed by Abacus Software; Command Post from Wilson WindowWare; FileApps by hDC Computer Corp.; File F/X by Metz Software (formerly the Threadz Software Design Group); PubTech File Organizer by Publishing Technologies; File Shuttle Xpress by GetC Software Inc.; Prompt by Access Softtek; Simple Win by Matesys Corp.; and, of course, the Microsoft

## THE SCORES



## Executive Summary

Windows' File Manager may provide all the file manipulation capabilities you need. If File Manager's performance is your biggest concern, you may be able to correct it with a short macro. (See "How to Make File Manager Five Times Faster," Page S95.)

If you hanker for a more comprehensive file manager, any one of the third-party products in this comparison will provide features not found in the Microsoft File Manager. Their approaches and capabilities can differ significantly, however.

File F/X, from Metz Software (formerly the Threadz Software Design Group), is the strongest overall workhorse. In addition to a straightforward and easy-to-use file manager, File F/X includes a customizable Task Manager and the capability to manipulate files that match any wild card or contain any text string. These capabilities are not available, or come at extra cost, in most of the other packages.

Prompt, created by Access Softtek, is an appropriate choice if you need file viewers. It's the only package reviewed here that offers viewers for several spreadsheet, word processing, and graphics file formats. When you need to clean house on your hard drive, peeking at files in this way, instead of opening them in their native applications, can save time.

The file transfer features of GetC Software's File Shuttle Xpress are an added bonus to its well-rounded file management program. The package includes versions that work with both

Windows and DOS, and thanks to its special hardware mini-adaptor, you no longer need to carry spare cables with your portable.

The other products reviewed have capabilities unique to their design philosophies:

Aporia, from NewTools Inc., almost completely replaces Windows icons, and offers a substantial value for people who want the capability to create a customized, graphical look.

Wilson WindowWare's Command Post takes the opposite approach, using an icon-free window as its streamlined interface to file management and other functions, which you can access through the program's own batchlike language.

The Becker Tools collection from Abacus Software provides the greatest number of file management choices in a single package, but the many menus and icons that access those functions make it difficult to learn.

hDC Computer Corp.'s FileApps is a polished set of related applications that includes a full text-search capability, but its file management can display only eight file names at a time in its small list boxes, making it hard to select the files you want.

Though Matesys Corp.'s Simple Win implements Macintoshlike, drag-and-drop capabilities, it offers few of the file management tools available in the other products.

The PubTech File Organizer also sports an interface that resembles the Macintosh display, but some of its functions can be confusing.

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Report Card	\$98
Features Chart	\$98

## Windows File Manager.

**THE DESKTOP METAPHOR.** These utilities will inevitably be compared with their counterparts in the DOS and Macintosh environments. We found that the Windows file managers in this review operated in ways strikingly different from either of these environments.

DOS shells, such as Norton Commander, PC Tools Deluxe, and Xtree, are typically limited by the standard 80-column-by-25-row display of most PC video boards. As a result, they commonly display two 40-column directory listings

side by side. Alternatively, they may display a directory tree on one side of the screen, with a directory listing on the other. You may copy or move files from one directory to another, selecting them by moving a cursor with the keyboard. Graphical file managers, however, are not limited to this number of columns and rows and offer a variety of ways to display as much information as your graphical display allows.

The Macintosh's file manager, the Finder, uses different size windows, rather than columns and rows, as the basic metaphor of the Mac environment. To

select files, you drag a mouse over the items you want to include. The mouse draws a dotted line around the file names, until you release the mouse button, which reverses the color of the icons. Dragging one of these icons moves them all into the new location, such as a different folder (directory). Because the dotted line used in this operation stretches to accommodate your actions, this visual device is often described as having a "rubber-band" effect.

Whether or not Apple's copyright lawsuit against the Microsoft Windows environment is having a chilling effect on

software development, none of the Windows file managers in this review duplicated the capabilities of the Macintosh Finder. Only four of the 10 products allow selection of files using a rubber-band approach. The remainder require you to select files with multiple mouse clicks, or from the keyboard.

Two of the products compared here that implement rubber-band dragging considerably from the Macintosh standard. Dragging a group of files in File Organizer, for example, causes those files to disappear from the screen, making it seem that the files themselves have been deleted; they return only after your copy operation is complete. Simple Win implements rubber-band dragging in a more Mac-like manner, but files may be selected only by dragging a mouse from the upper-left corner toward the lower right; no other direction of movement succeeds.

**ENHANCING THE MOUSE.** This does not mean that Windows file managers that don't use mice exactly like the Mac are difficult to use. In some cases, the procedure used to select files may be faster than the rubber-band method. Command Post, for example, enables you to select all files with a certain extension, by double-clicking the right mouse button on any file with that extension.

But we found that no two file managers let you select files in the same method. Nor is there any consistency in other commands or shortcut key combinations. On one end of the spectrum, the Windows File Manager—if you turn off all its confirmation options—allows you to delete every file on a drive by highlighting its root directory, then pressing the Delete key, followed by Enter. On the other extreme, pressing the Delete key in Becker

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W72

## None of the Windows file managers in this review duplicated the capabilities of the Macintosh Finder.

Tools returns you to a drive's root directory, wherever you happened to be in the directory tree. Other packages allow file deletions only by pressing Ctrl Delete, by choosing a menu option, and so on.

The best packages in this comparison, among them File F/X and Prompt, enable you to specify certain criteria for files—an extension such as BAK, or a string such as "1989"—and delete or copy all such files as a group. This can save you a significant amount of time over selecting such files individually, especially if you purge or archive files on a regular basis.

The relative youth of this product category, however, was revealed by a number of features that Windows file managers do not yet offer. None of the packages in this review can automatically select files that have their archive bit turned on—a flag DOS uses to indicate that the file has changed but has not been backed up. Detecting these files would provide an easy way to back up only those files that require it.

Nor do any of the packages include  
**See Introduction, Page 580**



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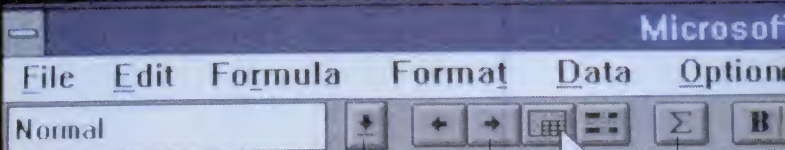


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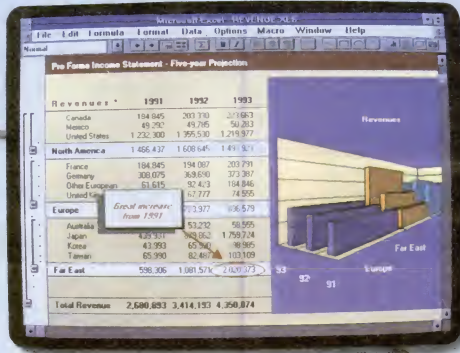
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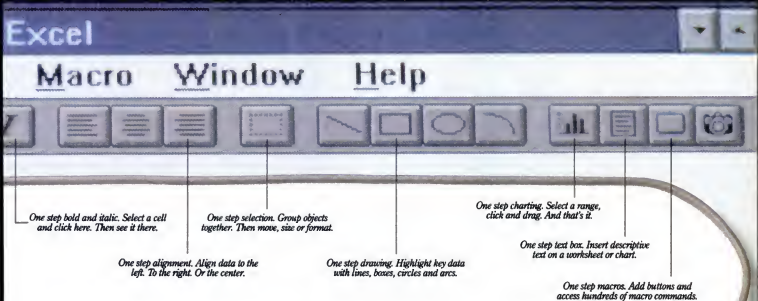
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# Introduction

Continued From Page 586

such relatively simple error checking as warning you before you attempt to copy a group of files to a destination disk that does not have enough room. File F/X handles this situation in the most elegant manner — if the destination for the files is a floppy drive, File F/X asks if you would like to insert another diskette and continue copying files. The other packages abort the transfer — in some cases, without informing you of the name of the last successfully copied file.

This type of limitation kept any of the packages in this comparison from earning a score of excellence in the categories of overall performance and ease of use. Even without these advanced features, however, these products all inspired confidence. None of them suffered from flaws that would lose data or cause file corruption.

**FILE PROTECTION.** On this note, it's important to mention one aspect of Windows that is a little-understood data integrity feature. Users must run the SHAREXEX program that comes with DOS prior to starting Windows, preferably in their AUTOEXEC.BAT file. The Share program prevents two Windows applications from opening and corrupting the same file — and two directory windows in a file manager may, in some situations, qualify as two different applications. Running Share to guard against this is described in the README file that comes with Windows, but few people notice it. This protection is gained by simply including the file name */R:2048 /L:20* in their AUTOEXEC.BAT. Share's services are not

**W**indows' Share program prevents two applications from opening and corrupting the same file.

required when writing to network drives.

**MAKE YOUR SELECTION.** To evaluate Windows file managers, we modified the test plan from our April 16, 1990, DOS shell comparison, offering one overall performance score, which includes the subcategories of file management, file viewers, the capability to create icons, and any bonus features. We also combined our standard categories of ease of learning, ease of use, and error handling into one overall ease-of-use score, and we combined support policies and technical support into one support score. Though we provide a complete report card and features chart, we have compressed the text portion of the comparison, highlighting only those areas in which each product stands out, either positively or negatively, rather than fully discussing each scoring category.

Brian Livingston is a network consultant based in New York and the author of *Windows 3 Secrets*, a book of *Windows*' undocumented features (IDG Books Worldwide, May 1991).

## Aporia Version 1.4b

Aporia, by NewTools Inc., offers a complete replacement environment for both the Windows File Manager and Program Manager.

Aporia gives the freedom to design and use your own icons, or any of dozens NewTools includes in the package. These icons have capabilities beyond those in Windows' own Program Manager.

Aporia icons are called tools; dragging one tool over to another performs such actions as printing or deleting a file, and so on. These tools may reside anywhere on the screen, all of which becomes a single desktop containing every function you have defined.

A file manager, Aporia provides two kinds of tools: tree tools, which show a directory tree for any drive you switch to; and directory tools — with names such as "C:" — which unfold to display a drive and any directories you have specified. Double-clicking a directory name in the Tree tool opens a second window to display the files contained in that directory.



Aporia's tools — bordering the screen — provide such capabilities as opening file directories and deleting files.

ry. (Directory windows, however, do not display subdirectories of the directory.) To view two directory trees side by side, you open the Tree tool twice.

The Aporia environment is strikingly different from Windows' own "shells" (programs that can launch other programs). Some functions work in ways that may not be obvious to the first-time user. To make one tool act upon another, for example, you must overlap the tool's upper left corner on the icon for the action you want. No other corner activates the operation. The documentation makes these functional differences clear. You can also run all the common Windows utilities, such as Program Manager, alongside Aporia tools.

NewTools plans to release a faster, graphically enhanced version of the

### PRODUCT SUMMARY

#### Aporia

VERSION 1.4B

**Company:** NewTools Inc., P.O. Box 3269, Church St. Station, New York, NY 10008-3269; (800) 395-1532; (718) 789-5980.

**List Price:** \$50.

**Requires:** Windows 2.0 or Windows 3.0.

**Pros:** Highly customizable, with useful drag-and-drop functions.

**Cons:** Viewing two shells requires opening two "tools" in separate windows.

**Summary:** A good choice for those who like to design their own desktop instead of using icons and functions provided by File Manager and Program Manager.

product this summer, which will offer features such as network security, password protection, and DDE support.

Aporia earns a good score for overall performance and ease of use, and it is a very good value for its low \$50 price.

## Becker Tools Version 2.0



Becker Tools' more than 50 tiny icons control a tremendous number of functions.

Becker Tools 2.0, a product developed in Germany and distributed in the United States by Abacus Software, offers the largest number of file management capabilities of any product in this review.

Becker Tools, for example, is the only package that can compare two files or directories to make sure they are the same, "wipe" files to prevent their undeletion by other users, and edit binary files in hexadecimal form. These capabilities add so much complexity to the package, however, that the average person might be bewildered. (In addition, shortly before publication, Abacus announced an upgrade, Becker Tools 2.0 Plus, that includes three new utilities for disk defragmentation, disk recovery, and disk backup.)

Becker Tools opens to fill the entire screen when it runs. The only method it uses to display directories and files is a matching pair of windows, side by side. To the left of and above these directory windows is a control panel bristling with more than 50 tiny "button" icons, each for a different purpose.

Departing significantly from Windows conventions, these icons do not bear a keyword beneath them to indicate their function. Instead, a status bar at the bottom of the screen changes its message every time your mouse pointer is above one of the icons. Since the icons are so small (about half the size of Program Manager icons), the pictures on them do not immediately convey what they do, and passing your mouse over this control panel at random (or studying the manual) is often necessary to find the function you want, such as "copy files" or "delete files." Once you have used a function button a few times though, it is fairly easy to remember its position.

You can turn off the display of the control panel, although this means that you must then use drop-down menus for most of the functions. Becker Tools also offers Beginning and Intermediate levels, which greys out some of the buttons. For its difficult learning curve, Becker Tools' ease of use rates only satisfactory.

Due to its extensive array of icons, Becker Tools claims 34 percent of the Windows System Resources when it is open, which may be a concern for people who must open many applications simultaneously.

However, no program in this comparison competes with Becker Tools for the sheer number of file management func-

tions the program puts at your fingertips, for a cost of \$130. This application is the best choice for someone who constantly needs to compare different directories and versions of files, and who is willing to spend a few hours learning what the different controls do.

### PRODUCT SUMMARY

#### Becker Tools

VERSION 2.0

**Company:** Abacus Software, 5370 52nd St. S.E., Grand Rapids, MI 49512; (616) 958-0330.

**List Price:** \$130.

**Requires:** Windows 3.0.

**Pros:** Most complete and powerful functions of any product in this review, including the capability to compare directories and edit binary files.

**Cons:** Too many functions are displayed on the screen for the average person to know which one to choose; uses one-third of Windows' System Resources.

**Summary:** With almost every conceivable file-manipulation function, Becker Tools is a powerful instrument in the hands of those who take the time to master it.

## Command Post Version 7.0a

Wilson WindowWare's Command Post displays a single, large window that contains a list of all files and subdirectories in the current directory, much like Windows' MS-DOS Executive. But unlike the Executive, Command Post is almost completely customizable. It allows you to place any command on a pull-down menu and make that command do just about anything you would otherwise do manually in Windows.

A complete language is included with Command Post, with over 100 functions that display dialog boxes and perform all the other functions available in the Windows environment. Any batch routine written in this language can be assigned a place on Command Post's menu line.

For example, you might define a command called Edit, which creates a dialog box showing a list of files in the current directory with the extension TXT. Double-clicking on one of these file names would load that file into Notepad. But unlike Windows' ordinary behavior, you could force Notepad to open up full-screen instead of in a small window, using Command Post's RunZoom statement instead of Notepad's Run.

If you need functions that aren't provided by Command Post's language, you may be interested in WinBatch, WindowWare's separate \$70 product. You can use WinBatch to develop small



Each of Command Post's unlimited number of windows can display a different directory or directory tree.

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—PC Week, December 24, 1990

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—PC Magazine, December 11, 1990

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but useful Windows applications, and even add functions to other applications' control-bar menus.

Command Post's own manual calls it the "DOS shell for Windows," because of its uncluttered file listings that eschew the use of icons. Because it uses only the System font for its displays, Command Post presents directory listings quite swiftly. This makes the product an excellent choice for anyone who spends a lot of time going through many directories looking for files and doesn't need little pictures to distinguish between programs and document names.

Speed alone does not justify a file manager though, and Command Post is certainly at its best when you take the time to write short routines for your most common operations and add them to its menu. Command Post practically *requires* some customization before you use it. For instance, several public-domain programs are listed on the menu as examples, but produce error messages when you click on one of them. This is confusing — WindowWare could have implemented working examples — and limits Command Post's use as a tool to satisfy. The program earns a very good score for value, however, because its low \$50 price and options for customization make it potentially much more than an MS-DOS Executive look-alike.

#### PRODUCT SUMMARY

### Command Post

VERSION 7.0S

**Company:** Wilson WindowWare, 2701 California Ave. S.W., Suite 212, Seattle, WA 98116; (800) 938-1740.

**List Price:** \$50.

**Requires:** Windows 3.0.

**Pros:** Windows' System font makes it fast; powerful batch language lets you add functions to menus.

**Cons:** No drag-and-drop mouse actions; some menu choices require customization before they are functional.

**Summary:** A "DOS shell" for people who like their Windows clean and fast. Command Post is a good choice to add batch-language capabilities to Windows; it also works with WindowWare's WinBatch development environment, a superset of Command Post.

### FileApps

Version 1.0

FileApps is a suite of small applications by hDC Computer Corp. The company produces a number of other utilities for Windows, such as the similarly named FirstApps, which includes a memory viewer and a desktop customizer.

FileApps consists of its own, separate "microapps," including File Enhancer Plus, which manipulates files; File Search, which finds files containing a text string; File Secure, which encrypts files; Disk Viewer, which shows the size of each directory's files on a bar chart; and Disk Share, a file transfer utility developed by Traveling Software.

Each of these functions is accessed through the MicroApp Manager, a separate program that loads the others. When you load MicroApp, it examines the directory from which it started and finds all microapps that are installed. As a default, it replaces the Control Bar icon in the upper-left corner of every Windows



Each FileApps "microapp" performs a function such as copying files, searching for text strings, or encrypting files.

application with an icon that reads "hDC." This extends the drop-down Control Menu so that, in addition to functions such as Restore, Close, etc., a menu to the right also lists File Enhancer and the other utilities. (The "hDC" logo means "a handle to a Device Context" — a familiar concept to C programmers, but a meaningless icon to most end-users.)

This change to Windows' conventions causes some slight ease-of-use problems. When you drag the Control Menu down with a mouse to start the File Enhancer, for example, you must slide the mouse through the standard menu, then over to another box to pick File Enhancer, then into another box for the function you wish to activate. If your current application is close to the right side of your screen, this final menu box appears not to the right of the Control Menu, but to the left. If you slide your mouse to the left to choose a function, however, the menu disappears. You must slide over or under the original Control Menu in order to let the mouse rest on the File Enhancer function you want.

This type of user-interface problem would be a mere quibble if it were not for the fact that, once you reach the File Enhancer, its display capabilities are quite limited. File Enhancer displays all file names in list boxes that can show only eight files at a time — similar to the File Open dialog boxes of most Windows applications. Other file managers can display 25 times as many file names in their full-screen windows, which makes for much easier file selection; there is no way to maximize File Enhancer to full screen.

The other FileApps miniprograms are attractive and work as expected, but

#### PRODUCT SUMMARY

### FileApps

VERSION 1.0

**Company:** hDC Computer Corp., 6742 185th Ave. N.E., Redmond, WA 98052; (206) 885-5550.

**List Price:** \$130.

**Requires:** Windows 3.0.

**Pros:** Files that match certain wild cards, text strings, or file creation dates can be posted into an application that copies, moves, or deletes them.

**Cons:** List boxes are too small to see more than eight file names at one time; four different applications must be accessed through an add-on to Windows' Control Bar.

**Summary:** FileApps provides integrated ways to search for a variety of files and manipulate them in groups, but the small windows in each of the "microapps" may be too limited for browsing for files comfortably.

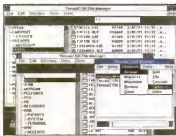
suffer from similar limitations. The text-search function in hDC's File Search is implemented more usefully in File F/X (you can print text files directly from File F/X's results list, for example), and every file manager has a more generous working window than File Enhancer. hDC's encryption and disk sharing functions are about the same as those in Prompt and File Shuttle, if you need those capabilities. Its mediocre showing restricts FileApps' overall performance score to satisfactory, as well as its value score, because it is one of the more expensive packages at \$130. hDC's manual for the applications, however, includes some of the clearest and best-organized material of the products compared, and earns a score of very good for documentation.

### File F/X

Version 1.0a

File F/X, from Metz Software (formerly Thread Software Design Group), stands out as one of the best integrated and most useful packages in this comparison. File F/X makes it possible for you to totally replace Windows' File Manager and Program Manager. In addition, Metz includes a magnificent substitute for the Windows Task List, a small window that pops up when you press the Ctrl-Esc key combination, or double-click anywhere on an unoccupied space on the Windows desktop (the patterned background).

Ordinarily, the list that appears only allows you to switch to other active applications. File F/X's Task Manager



You can use Metz's File F/X to replace the Windows File Manager, Task Manager, and Program Manager.

also allows you to start any application, and it remembers the last 20 commands you gave, so you can pick them from it instead of typing them over. You can also customize the Task Manager's menu, adding any applications that should be easily available. This customized list also appears on File F/X's File Manager menu; any change you make to the menu in one application instantly updates the other's menu.

Metz's File Manager itself is a well-thought-out utility that is a pleasure to use. For example, when you specify a directory that doesn't yet exist as the destination for a group of files, File F/X asks whether you would like to create such a directory. If so, it makes the directory for you and deposits your files in it. The Windows' File Manager, on the other hand, requires a separate step to create the directory first.

The integration exhibited between the File Manager and Task Manager carries through to File F/X's other functions as well. If you search for a group of files that match certain file names or text strings (across multiple drives, if desired), you can display the resulting list of files in the File Manager's directory window. From there, you can print the list, insert the

words into a text editor, and delete, move or copy the files.

File F/X is also the only file manager in this comparison that doesn't just abort when you fill a diskette before you have finished copying over all your selected files. When the disk is full, it prompts you to insert another diskette.

When File F/X loads, it occupies all but the icon line of your screen area, in a position Metz refers to as "optimized." (The Task Manager can also "optimize" all your active applications on command, giving them maximum usable area without obscuring your minimized programs.) File F/X displays a directory tree on the left and a single directory listing on the right, but you can display two or more directories by starting another "instance" of File F/X and tiling the two instances side-by-side. Instead of the non-mnemonic keyboard shortcuts that the Windows File Manager uses (such as F7 and F8 for Move and Copy, which are easily confused), File F/X uses Ctrl-M for Move, Ctrl-S to Select All, and so on.

Due to all the above features and more, File F/X earns a score of very good for overall performance and ease of use.

File F/X's price of \$130 falls in the midrange for the products in this comparison; considering all that it offers, it qualifies for a value rating of good.

#### PRODUCT SUMMARY

### File F/X

VERSION 1.0A

**Company:** Metz Software (formerly Thread Software Design Group Inc.), 4018 148th Ave. N.E., Redmond, WA 98052-5165; (800) 767-6292, (206) 869-6292.

**List Price:** \$130.

**Pros:** Allows you to move files to directories as you create them; can move files to multiple floppies in one operation; integrated wild card and text filter.

**Cons:** Displays only one directory tree and listing unless you open two instances of the application and tile them.

**Summary:** File F/X is the most integrated and polished package of the group, and is a superb replacement for both the Windows' File Manager and Task Manager.

### PubTech File Organizer

Version 3.1

The Publishing Technologies — PubTech — File Organizer is another package that offers a total replacement for the Windows environment's File Manager and Program Manager shell programs, in some ways similar to Aporia.

When File Organizer loads, it displays icons representing all your drives along the right side of your screen. Other icons that represent your printer and a garbage can appear along the bottom of the screen.

When you open a directory window, File Organizer displays your files in the shape of large icons, each identified by a name in a box underneath. You can drag a mouse over these icons to select them, then drag the group to a printer icon or the garbage can to print or delete them. Using the Desktop Manager and Icon Manager that are included, you can customize the look of File Organizer.

With all these Mac-like features, however, File Organizer manifests sur-



# With Word for Windows, what you see is what you get.



PC Magazine, December 11, 1990



PC World, May 1990



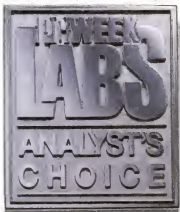
InfoWorld: Product of the Year, February 4, 1991



Byte, January 1991



InfoWorld: Buyers Assurance, January 7, 1991



PC Week, December 24, 1990



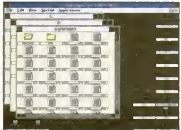
**WYSIWYG.** Generally it means what you see on-screen is what you get from the printer. But, with Microsoft Word for Windows it also means you're getting the best Windows word processor avail-

able. Just one look above proves it. Why not call (800) 426-9400, for the name of the dealer nearest you. And see exactly what you could be getting.

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prising weaknesses. As with all the file managers in this review, we created directories, copied files into them, then moved and deleted these directories. After deleting such a directory in File Organizer, that directory's "folder" icon disappeared from the screen in one view of the drive, but not in other views of the same drive. When opening and closing different windows, the directory sometimes appeared and other times did not. Even exiting Windows, rebooting the machine, and loading File Organizer so it could re-read the drives did not eliminate



You can drag PubTech File Organizer's large icons to the printer icon to print, or to the garbage icon to delete.

this problem.

Poring through the manual did not reveal that you must "purge" the garbage to force File Organizer to display the true status of such directories (which we learned by contacting technical support). Anomalies such as this could cause a hurried person to err seriously in managing files. As a result, the product earns a rating of poor for ease of use.

At \$200, File Organizer is also the most expensive package in this review, limiting its value score to satisfactory.

#### PRODUCT SUMMARY

### File Organizer

Version 3.1

**Company:** Publishing Technologies Inc. (PubTech), 7719 Wood Hollow Drive, Suite 260, Austin, TX 78731; (800) PUB-TECH, (512) 346-2835.  
**List Price:** \$200.

**Requires:** Windows 3.0.

**Pros:** Uses large, Mac-like file icons when displaying directories.

**Cons:** Deleting a directory from a drive doesn't automatically change the view of the drive that appears; tries to keep reading floppy drive after you switch away.

**Summary:** A totally icon-driven interface that suffers from some rough edges and rather dated, flat-looking graphics compared to those of Windows itself.

### File Shuttle Xpress Version 5.0

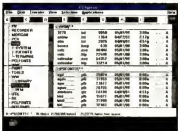
GetC Software promotes File Shuttle Xpress as a high-speed file transfer utility, with special emphasis on the needs of portable computer users. But File Shuttle is surprisingly powerful as a Windows file manager and competes favorably with File F/X and Prompt (although it lacks some of those packages' capabilities to operate on multiple directories). Priced at \$140, File Shuttle Xpress is a good choice even if you never need to transfer files between two computers.

This month, GetC began shipping Version 5.02 of the program, after we had

completed our comparison. The upgrade adds the capability to instantly load a directory tree (versus having to load the drive each time).

File Shuttle Xpress loads as a window that occupies almost the entire screen, but leaves your icon line in plain view. The directory tree of the current drive is normally displayed on the left, with a directory listing on the right. You can switch the display so that the top half of the window shows one drive's tree and directory list, while the lower half displays another. If you need more room in the left window to display a directory tree with many levels, you can simply drag the window's border with a mouse to enlarge it. The program allows you to select and manipulate files in much the same way as File F/X, Prompt, and other packaged file.

File Shuttle's "Xpress" file transfer features make this package ideal for anyone who constantly shuffles files between portable and desktop computers. The package includes a small connector, referred to by GetC Software as a "Rocket Socket" adapter, which allows you to transfer files using the parallel ports of your portable and any desktop PC. This frees you from carrying special serial cables with your portable (though it does work with the serial port), because every PC has a parallel port, and nearly every office has at least one printer cable.



File Shuttle Xpress displays sizable directory trees and directory windows side by side.

(This review, however, did not test the communications capabilities of packages with such a feature.)

To use this feature, you plug this Rocket Socket adapter onto your portable computer's parallel port, then connect the printer end of the desktop PC's parallel cable to the adapter. File Shuttle includes file manager software for both

#### PRODUCT SUMMARY

### File Shuttle Xpress

Version 5.0

**Company:** GetC Software Inc., P.O. Box 8110-182 250 H St., Blaine, WA 98230-8110; (800) 663-8066, (604) 684-3230.  
**List Price:** \$140.

**Requires:** DOS 2.0 or later and/or Windows 3.0.

**Pros:** Displays multiple drive trees and directories; includes a useful and innovative file transfer connector that uses any printer cable to link two PCs.

**Cons:** Menu-driven — no drag-and-drop moving of files.

**Summary:** File Shuttle is an easy-to-use utility for copying, moving, and deleting files and directories, and offers the bonus of allowing you to perform all these functions between two PCs, using Windows or DOS.

Windows and DOS, so neither computer requires Windows.

File Shuttle's clean interface and relatively full-featured capabilities, in addition to its file-transfer approach, earned it a score of very good for ease of use.

### Prompt Version 2.0b

Prompt, from Access Softtek, provides a set of features unlike any other file manager, including file compression and encryption and a masterful set of file viewers. This makes Prompt the best choice for those who need to examine a series of files to determine which ones should be deleted, moved, or backed up.

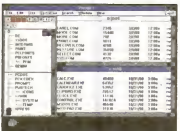
The viewers included with Prompt can display spreadsheet files from Excel and Lotus 1-2-3 (up to version 2.2); text files from WordPerfect, Microsoft Word for DOS, and Windows Write; graphics files from Paintbrush and other sources; and plain text files.

These viewers generally worked well, but revealed a little immaturity in certain cases. All graphics files are displayed at the same size, whether they are little 32-by-32 pixel bit maps or giant wallpaper files, and only the first two rows of spreadsheets can be displayed. This is far more capability than is provided by the other file managers in this comparison, however, and may be plenty to jog your memory about the contents of a file. Prompt's bonus viewing capabilities, combined with its file management strengths, result in an overall performance rating of very good.

When you initialize Prompt, its window loads at a random size determined by Windows, but you can resize or maximize this window. Prompt begins by displaying nothing but a row of icons representing drive letters; this allows the program to load very quickly, but it then requires a delay when you go to select a drive (instead of reading all drives when it first loads).

Prompt ordinarily displays a directory tree on the left and a directory listing on the right. You can display more than one directory tree by holding down the Shift key when selecting another drive letter. Double-clicking on any directory in a tree opens a directory window. You can switch the directory window by clicking its title bar and, unlike the Windows File Manager, all title bars rearrange themselves to remain visible when you bring a new one to the front.

Prompt offers some useful file selecting and mouse-dragging functions, but they are implemented in a way that requires a little practice to remember them. To drag files, you must first hold down the Ctrl key while clicking on them with the mouse. A feature not documented in the manual (but mentioned in a README file) is the capability to drag a



Prompt displays the amount of disk space filled on each drive letter by the amount of red in the upper-left corner.

file using the right mouse button. No rationale is given for varying from the Windows File Manager approach to these tasks. Such variations make the package slightly harder to master than necessary, and they cause us to award a score of good instead of very good in the ease-of-use category.

Although you can purchase it separately for \$130, Prompt is marketed as an integrated product with DragNet, Access Softtek's full-text search package. DragNet offers better text-search capabilities than other packages in this review. It lets you define a search such as "Jan or Feb or Mar AND 1988 or 1989 or 1990," which finds all documents you wrote in the first quarter of the last three years. You can paste the items that match the search into Prompt to copy, move, or delete the files.

However, DragNet is a \$145 add-on, while packages like File F/X include capabilities almost as comprehensive. This kept Prompt's score for value at a rating of good rather than very good. If you don't mind the combined price, though, Prompt and DragNet make an impressive team.

#### PRODUCT SUMMARY

### Prompt

Version 2.0b

**Company:** Access Softtek, 3204 Adelaide St., Berkeley, CA 94703; (415) 654-0116.

**List Price:** \$130.

**Requires:** Windows 3.0.

**Pros:** Includes many extras, including encryption and compression of files, as well as viewers for word processing, spreadsheets, and graphics files.

**Cons:** You must place the program in "copy mode" or "move mode" before dragging files; some required Ctrl-key combinations are difficult to learn.

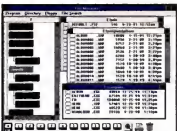
**Summary:** Prompt is a promising File Manager replacement. It includes enough unique features that you may decide to purchase DragNet, its \$145 separate but integrated full-text search application.

### Simple Win Version 3.1

Mateys Corp.'s Simple Win is the file manager that lies closest in spirit to the interface used by the Macintosh Finder. Simple Win, however, allows its "simplicity" theme to limit it in ways that do not hold back the other file managers in this comparison. For example, there is no way to create a directory until you first remove all files and subdirectories within it. Additionally, you must go through a nested menu to specify whether your next operation will be a File Copy or Move. In addition, the program doesn't let you search for a particular file name on more than one drive, print a directory listing, or perform many other tasks offered by other products in Simple Win's \$99 price range.

We found it very easy to perform the actions that Simple Win does allow, however. Its File Manager's window includes a printer icon and a garbage can icon. Simple Win displays a directory tree on the left and a directory listing on the right, and dragging file names with a mouse to either of the symbolic icons performs the expected action.

In addition to a file manager, Simple Win includes an Applications Organizer



Simple Win's File Manager displays files as icons or as lists; you can select files using a "rubber-band" mouse method.

and an Album. The Applications Organizer allows you to define icons that start programs. But each window is limited to 12 icons in fixed positions. Windows' own Program Manager far exceeds these capabilities. The Album functions as a scrapbook that allows you to save files in a variety of graphical and text forms supported by the Windows Clipboard.

Learning these features is a somewhat hazy process, however. Simple Win ships on a diskette labeled "Version 3.0," but the File menu (there is no Help menu) identifies the actual version as 3.1—and the manual refers to Version 2.0. Some menu options were not touched on in this manual and did not work as expected, so there was no way to verify how they should be used. These problems lowered Simple Win's scores to poor for documentation and satisfactory for ease of use value.

#### PRODUCT SUMMARY

### Simple Win

VERSION 3.0

**Company:** Matsys Corp., 900 Lakeside Landing Circle, Suite 175, Lakeside, CA 94039; (800) 777-0545, (415) 925-2900.

**List Price:** \$99.

**Requires:** Windows 3.0.

**Pros:** Uses very simple and intuitive Mac-like methods.

**Cons:** Limited range of functionality.

**Summary:** Though it lacks the capability to delete a whole subdirectory, search for files that match certain criteria, or act as a Windows "shell" program, Simple Win is a good choice for users with simple needs, but fails to match the file management features of other packages in this review.

### Windows File Manager

Version 3.0a

The strength of Windows' own File Manager lies in its use of multiple, sizable directory windows contained within one large, main window. Microsoft invented the Multiple Document Interface (MDI) that makes these "child windows" possible and proves its mastery of the technology by the elegant manner in which these subwindows open and close on command. You can display any number of directories or directory trees (which are opened by double-clicking the root directory of a drive before selecting a new drive).

For this comparison, we looked at Version 3.0a of Windows. Although packages of Windows 3.0a still say "3.0," you can identify the more recent version by the row of four asterisks that appears

underneath the version number on a stick-on label.

Microsoft made the File Manager relatively easy to use by refraining from inventing "new" uses for the mouse. Unlike some other file managers in this comparison, the left mouse button is used for everything, and when you drag something, it moves—you do not need to activate a "move mode."

The File Manager rereads every drive, every time it is selected. Its slow performance has alienated many Windows users. This slowness can be alleviated by a macro (see sidebar, this page), but other problems are more difficult to correct. The most serious is that File Manager



After running a macro, File Manager displays drives in individual windows, which may be switched among instantly.

does not protect you against deleting an entire subdirectory or a whole drive. You can, indeed, turn on its Confirm-on-Subtree-Delete option, but when you highlight a directory and then press the Del key and Enter, File Manager deletes all files in that directory—and then asks if you want to remove the directory name. This, of course, is no confirmation at all.

Another menu choice that can cause difficulties is Print, which sends text files to the current printer. Somehow, File Manager ignores the Windows printer driver and prints outside the printable area on Hewlett-Packard LaserJet III printers. This results in one line on each page being cut off, which renders the Print feature useless for files longer than one page. (Microsoft was able to duplicate this error but does not yet have a solution.) These problems resulted in a lowering of File Manager's score for the performance category from good to satisfactory and for ease of use from satisfactory to poor.

Since the product is free of charge, however, we awarded it a score of good for value.

#### PRODUCT SUMMARY

### Windows File Manager

VERSION 3.0A

**Company:** Microsoft Corp., 1 Microsoft Way, Redmond, WA 98052; (206) 882-8088.

**List Price:** Included with Windows.

**Requires:** Windows 3.0.

**Pros:** Provides an unlimited number of sizable windows to display drive trees and directories; free.

**Cons:** Poor error handling of printing and subdirectory deletion confirmations; slow unless you use a macro to speed up the process of changing drives.

**Summary:** File Manager uses the Windows interface standards well, but lacks many of the features included with third-party utilities. However, the price is right.

## How to Make File Manager Five Times Faster

One of the most frequent criticisms of the Windows File Manager is that it takes too long to switch from one drive to another. This is actually one of its easiest problems to correct.

You can use the Windows Recorder application to save a 10-keystroke macro that speeds up File Manager when changing the current drive. In our tests on a 16-MHz 386 PC, File Manager required about 2½ seconds to switch from drive D: to drive C:—two 20-megabyte drives, each with about a dozen directories. But after placing this macro into File Manager, switching back and forth between drives took less than half a second, actually faster than we could issue the commands.

Take the following steps to record this macro for yourself (this script uses drives C: and D: as examples):

1. The File Manager must be the last program on the RUN—line of your WININI file. Edit this line to read RUN=WINFILE.EXE, and restart Windows.

2. Once the File Manager is running, it should be displaying the current drive in its directory tree. (This example assumes drive C.) Pull down File Manager's File menu and click Run. In the dialog box that appears, type "RECORD" and click OK. This opens the Recorder's window.

3. Pull down the Recorder's Options menu, and turn on these options: Control+Break, Shortcut Keys, and Minimize. Then pull down the Macro menu and click Record. This opens a macro dialog box.

4. Give the macro a name, and assign the macro to Ctrl+Shift-F10. Make sure the other options are set: Playback to the Same Application, Fast, and Ignore Mouse. Click the Start button to record the actual macro.

5. While you are recording, the Recorder window minimizes itself so you can work in the File Manager window. Type the following keystrokes (do not type the comments):

```
Enter (opens drive C)
Ctrl-D (switches back)
Ctrl-D (switches to D)
Enter (opens drive D)
Ctrl-B (switches back)
Shift-F4 (tries all)
Ctrl-Break (stops recording)
Alt+S (saves the macro)
Enter (confirms save)
```

6. After recording this macro, File Manager should display three windows, side by side. Click the title bar or a blank spot in any window to quickly switch to that drive.

7. When you quit the Recorder, save the macro to a file named MACROS, in any directory on the Path (the period at the end of MACROS is important).

8. Exit Windows, and restart it with the following command (again, the period is important). You can place this in a batch file, if you like:

```
WIN RECORDER —H A+F10 MACROS.
```

9. Windows starts the File Manager, then plays your macro into it. This takes a few seconds, as the File Manager reads the drives, but saves time thereafter.

10. If you want some other application to come to the foreground instead of the File Manager, re-record the macro. This time, press Ctrl-E after Shift-F4 in the Windows Task List that appears, press the first letter of the application you want in the foreground, then press Alt+S to switch to that application. Then press Ctrl-Break and continue as before.

11. In the command line that starts Windows in Step 8, the symbols "—" and "+" stand for Ctrl and Shift, respectively. If you record a macro using the Alt key, the symbol for this is a percent sign (%). The "—H" switch forces Recorder to play the hotkey defined in the file you named. And writing the macro into a file with no extension saves clutter on your screen when the Recorder loads and displays the filename.

—Brian Livingston

## How We Tested, Scored Windows File Managers

To compare Windows file managers, we adapted the test plan from our April 16, 1990, DOS Shell product comparison. We reduced the number of scoring categories, combining ease of learning, ease of use, and error handling into one general ease of use category.

Performance scores consist of the product's overall file management capabilities, its capability to generate menus and icons, and how many—if any—file viewers it offers. Prompt was the only package that offered a significant number of file viewers, though several of the packages could view ASCII files. We also consider the extra features that each of the packages offers, such as File Shuttle Xpress' file transfer capabilities and Command Post's scripting tools.

For a satisfactory score, a package must be capable of copying/moving files on a single drive, tagging files in a directory, and moving a file to another drive. For a good score, a package must be capable of changing file attributes, moving files across drives; showing disk

statistics (remaining space); and showing two directories. To boost a score to a very good, a program must be capable of manipulating all matching files across directories within a drive and searching for files that contain a specified text string. An excellent score is awarded to a package that includes these capabilities and more significant extras, such as manipulating all matching files across drives.

Documentation scores reflect the quality and completeness of instructional and reference information included with the packages.

For ease of use, we evaluate the user interface and the program's design from the point of view of the new user, considering the complexity of the program and the quality of learning-related documentation and tutorials. In addition, we require that a program offer protection against data loss.

The support a score consists of support policies and technical support.

Value scores reflect the price vs. the performance and features.





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## REPORT CARD

## Windows File Managers



	(InfoWorld weighting)	(Your weighting)	Aperia Version 1.4b	Becker Tools Version 2.0	Command Post Version 7.0s	FileApps Version 1.0	File F/X Version 1.0a	PubTech File Organizer Version 3.1	File Shuttle Xpress Version 5.0	Prompt Version 2.0b	Simple Win Version 3.1	Windows File Manager Version 3.0a
List price			\$50	\$130	\$50	\$130	\$130	\$200	\$140	\$130	\$99	Bundled
Performance	(400)	( )	Good	Good	Good	Satisfactory	Very Good	Good	Good	Very Good	Good	Satisfactory
Documentation	(75)	( )	Good	Good	Good	Very Good	Very Good	Good	Good	Good	Poor	Good
Ease of use	(250)	( )	Good	Satisfactory	Satisfactory	Good	Very Good	Poor	Very Good	Good	Satisfactory	Poor
Support	(100)	( )	Very Good	Very Good	Very Good	Good	Very Good	Good	Very Good	Good	Satisfactory	Very Good
Value	(175)	( )	Very Good	Good	Very Good	Satisfactory	Good	Satisfactory	Good	Good	Satisfactory	Good
Final scores			<b>6.5</b>	<b>6.0</b>	<b>6.2</b>	<b>5.6</b>	<b>7.2</b>	<b>5.0</b>	<b>6.6</b>	<b>6.7</b>	<b>5.3</b>	<b>4.9</b>

Use your own weightings  
to calculate your score

## GUIDE TO REPORT CARD SCORES

InfoWorld reviews only finished, production versions of products, never beta test versions.

Products receive ratings ranging from unacceptable to excellent in various categories. Scores are derived by multiplying the weighting (in parentheses) of each criterion by its rating, where:

Excellent = 1.0 — Outstanding in all areas.

Very Good = 0.75 — Meets all essential criteria and offers significant advantages.

Good = 0.625 — Meets essential criteria and includes some special features.

Satisfactory = 0.5 — Meets essential criteria.

Poor = 0.25 — Falls short in essential areas.

Unacceptable or N/A = 0.0 — Fails to meet minimum standards or lacks this feature.

Scores are summed, divided by 100, and rounded down to one decimal place to yield the final score out of a maximum possible score of 10 (plus bonus). Products rated within 0.2 points of one another differ little. Weightings represent average relative importance to InfoWorld readers involved in purchasing and using that product category. You can customize the report card to your company's needs by using your own weightings to calculate the final score.

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## FEATURES

## Windows File Managers

Feature	Aperia Version 1.4b	Becker Tools Version 2.0	Command Post Version 7.0s	FileApps Version 1.0	File F/X Version 1.0a	PubTech File Organizer Version 3.1	File Shuttle Xpress Version 5.0	Prompt Version 2.0b	Simple Win Version 3.1	Windows File Manager Version 3.0a
Price	\$50	\$130	\$50	\$130	\$130	\$200	\$140	\$130	\$99	Bundled
<b>Interface/ease of use</b>										
Point-and-shoot data files	■	■	■	■	■	■	■	■	■	■
View two directories at once <sup>1</sup>	■	■	■	■ <sup>2</sup>	■	■	■	■	■	■
Visual tree display	■	■	■	□	■	■	■	■	■	■
Full disk warning when copying	□	□	□	□	□	□	□	□	□	□
Confirms file deletes	■	■	■	■	■	□ <sup>3</sup>	■	■	□ <sup>3</sup>	■
Confirms subdirectory deletes	N/A	■	■	■	■	□ <sup>3</sup>	■	■	■	□ <sup>4</sup>
<b>File manipulation</b>										
Move files across drives	■	■	■	■	■	■	■	■	■	■
Move entire directories	■	■	■	■	■	■	■	■	□	■
Create directory	■	■	■	■	■	■	■	■	■	■
Remove empty directory	■	■	■	■	■	■	■	■	■	■
Delete directory and all files	□	■	■	■ <sup>5</sup>	■	■	■ <sup>6</sup>	■	□	■
Tag files using keyboard and mouse	■	■	■	■	■	■	■	■	■	■
Tag files using "rubber-banding"	□	□	■ <sup>7</sup>	■ <sup>8</sup>	□	■	□	□	■	□
Tag all files in directory by command	■	■	■	■	■	■	■	■	■	■
Tag files in different directories	□	□	□	■	□	□	□	■	□	□
Compare two directories, tag differences	□	■	□	□	□	□	□	□	□	□
Manipulate all matching files on drive	■	■	■	■	■	■	■ <sup>9</sup>	■	■	■
Manipulate all matching files across drives	□	□	□	■	■	■	■ <sup>9</sup>	■	□	□
Manipulate files containing text string	□	□	□	■	■	■ <sup>10</sup>	□ <sup>11</sup>	□	□	□
Wipe files	□	□	□	□	□	□	□	□	□	□

<sup>1</sup> In multiple windows, subwindows, or using two instances of the program itself.

<sup>2</sup> Limited to list box size.

<sup>3</sup> File Organizer and Simple Win do not ask for confirmation before deleting files or directories, because you can recover these from a "trash can."

<sup>4</sup> Only after all files in subdirectory are already deleted.

<sup>5</sup> Deleting a directory or any file specification containing a wild card requires depressing Shift key.

<sup>6</sup> Removes a directory and all its files, but not a directory containing subdirectories.

<sup>7</sup> Dragging mouse over file listing with the right mouse button depressed selects any number of files.

<sup>8</sup> Dragging mouse over file names in a list box selects any number of files.

<sup>9</sup> One directory at a time.

<sup>10</sup> One at a time; cannot copy or print all, for example.

<sup>11</sup> With DragNet, an additional \$145 utility.

## FEATURES

INFO  
WORLD

## Windows File Managers

■ Feature □ No Feature	Aparia Version 1.4b	Becker Tools Version 2.0	Command Post Version 7.0s	FileApps Version 1.0	File F/X Version 1.0a	PubTech File Organizer Version 3.1	File Shuttle Xpress Version 5.0	Prompt Version 2.0b	Simple Win Version 3.1	Windows File Manager Version 3.0a
<b>User menus and icons</b>										
Create customized pull-down menus	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Create customized icons	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Display user-defined icons	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Maximum number of icons	Unlimited	N/A	N/A	N/A	N/A	Unlimited	N/A	N/A	12 <sup>12</sup>	N/A
Nested icon groups	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Password protection	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Memory used (entire application)	63K	153K	56K	61K	41K	82K	105K	63K	26K	39K
Percent system resources used	5	34	6	13	6	6	8	4	6	6
Memory not reclaimed when closed	22K	31K	2K	6K	2K	18K	7K	3K	2K	4K
<b>Other features</b>										
Lets you limit visible drive letters	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Format diskettes	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Manipulate files with archive bit on	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Print text files to current printer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Compresses/decompresses files	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Replaces Windows Task Manager	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Compares file copies with originals	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Can replace Program Manager as "shell"	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Screen saver	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Undelete files	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Print directory listing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Encrypts files	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
File transfer to external PC	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Integrated text editor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maximum size text edit	N/A	32K	N/A	N/A	N/A	Unlimited	N/A	N/A	N/A	N/A
Move text between files without closing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Search files for text string	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>File viewers</b>										
1-2-3 (WKS, WK1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1-2-3, Release 3 (WK3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ASCII	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Text wrap ASCII	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AutoCAD SLD graphics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Binary files - hex mode	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Binary files - text mode	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BMP graphics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CGM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DCA/RTT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
dBase (DBF)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Excel (XLS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HPGL graphics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lotus Ami	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Microsoft Word/DOS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Microsoft Word/Windows	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Paradox	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCX graphics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TIFF graphics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Windows Write	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Word Perfect	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<sup>12</sup> Simple Win allows 12 icons per window.<sup>13</sup> Only when compressing files.<sup>14</sup> Only during file transfer.<sup>15</sup> Also prints files in hex form.<sup>16</sup> Copies file names to Clipboard, where they can be pasted into Notepad and printed.<sup>17</sup> Via Clipboard to Notepad.<sup>18</sup> With File Organizer's Copy dialog box visible. More or less memory is required for other functions.<sup>19</sup> Using selected files or a list of files.<sup>20</sup> Only first two rows.

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## FONT FUTURE

# TrueType Will Help Resolve the Font Puzzle

Windows 3.1 Promises to Make TrueType a Standard,  
But Some Confusion Will Undoubtedly Plague Users

BY KRISTI COALE

Since Windows' arrival, dealing with fonts has been a little like trying to work a complicated anagram. But technology on the horizon may finally offer users a straightforward solution.

TrueType, created by Apple Computer and licensed by Microsoft for its upcoming Windows upgrade, promises to change the way Windows users create and share documents. And because it will be an integral part of the operating system, and thus be available to all users who upgrade, it will give Windows a font standard that is guaranteed broad support by applications and printer developers.

"That TrueType will be given away is reason enough to say it will be a standard," said Daniel Will-Harris, a Marin, California-based author. "More people now don't use fonts than do use them. That's why TrueType is going to be very important to Windows [because it will introduce these users to fonts]." Will-Harris said.

TrueType is currently shipping only on the Macintosh platform, as part of the newly released System 7.0 and as a system-level document with Apple's two latest low-end printers. But with Microsoft's boasting over 3 million Windows users and reports circulating that Windows 3.1 is on the horizon, TrueType could become a force to reckon with overnight.

Microsoft is doing the right thing with TrueType to reach the heart of the business community, which doesn't go out and buy these kinds of things, said Rob Oster, an analyst with BIS CAP International, in Norwood, Massachusetts.

"People who have access to technology that is free are likely to become users," Oster said.

Endless comparisons have been drawn between Windows and the Macintosh, on cosmetic issues alone. Soon to be added to this list will be printing, because TrueType, coupled with a printing technology tailored to Windows in TrueImage, will bring to the PC some semblance of the stable printing environment that exists on the Mac, with its combination of Type 1 fonts and PostScript printers.

Because TrueType will be a part of the operating system, users should expect that most Windows applications will support it. This should prevent incompatibilities among applications, fonts, and printers, according to Microsoft.

"We're in a period now [on the PC] where applications don't have to be self-sufficient in terms of fonts and printer drivers [as happened under DOS]," said Dan Steele, director of Microsoft's printer business unit. "It's now more centralized, and applications can depend on the operating system to provide a basic functionality, including fonts and printing," Steele said.

**FONT WOES.** Desktop publishing and the advent of graphical user interfaces such as

Windows increased the average PC user's awareness about such things as fonts. And over the past year, Adobe Systems Inc., Microsoft Corp., and to a lesser extent, Apple Computer have spent the brunt of their efforts trying to upstage one another to garner more of the limelight for their respective font technologies.

Perhaps the biggest irony of the font wars is that the winning technology will be the one that is not only ubiquitous across Mac and PC platforms but also completely invisible to the end-user.

But while users are generally aware of different fonts such as Helvetica and Swiss and different weights such as bold or italic, the idea of dynamic technologies that build fonts differently may be a bit foreign to them.

This is no small wonder given that at least six font technologies exist under DOS or Windows: Digital Typeface Corp.'s Nimbus Q, Bitstream Inc.'s FontWare and Speedo, Monotype Inc.'s F3, Adobe Type 1 PostScript, and Intellifont from Agfa/Compugraphic.

As document creation and printing on the PC stand now, font technologies are not only highly visible but also annoying.

Applications are not compatible with all of these technologies, and printing is a even bigger headache because a printer's drivers not only have to be compatible with a given program but also with a font technology. Conceivably, a user could create a document with fonts that are compatible with his application but are incompatible with a printer driver.

As for document interchange, it's virtually impossible given that one user's PC doesn't have the same fonts as the next user's PC. To alleviate this problem and to enhance Windows, Microsoft decided it needed to include a font rasterizing technology that builds and scales outlines of font bit maps for screen or printer use in its operating system.

**OVER-CHARTERED TERRITORY.** Among the technologies that Microsoft considered to address Windows' font limitations was Intellifont, said Jonathan Seybold, publisher of *The Seybold Report on Desktop Publishing*, in Malibu, California.

Intellifont would have been a logical choice, because it is an integral part of Hewlett-Packard printers, which have the biggest share of the PC printing market, according to Seybold, Oster, and others.

Also a contender was Adobe's Type 1, though at that time Adobe continued to refuse to open the specification, despite threats from Microsoft and other vendors. With an open Type 1, Microsoft and font vendors would have been free to develop and distribute fonts under this technology without having to ante up to Adobe financially.

By all analyst and vendor accounts, the introduction of TrueType into the font wars forced Adobe to open Type 1 in September of 1989, a move that encouraged more foundries to develop for the format. This has had the effect of giving users a wider choice of fonts, which has brought the price down.



**FONT ENVY?** Although much potential energy is building up around TrueType, users who have considerable investments in other font technologies, including Intellifont and Speedo, should not feel as though these are lost. At least one font conversion utility exists on the market today.

"You have a considerable number of Intellifont and FontWare users on the PC," said Russ McCann, president of Ares Software, in Foster City, California, which recently began shipping a Mac-based font conversion and creation utility called FontMonger.

"To do a conversion utility for the PC, you have to support all of these and not just pay attention to Type 1 and TrueType," McCann said.

Among its many functions, FontMonger converts Type 1 and Type 3 PostScript fonts to TrueType, and these conversions are two-way. Such utilities are cropping up to help users with investments in Type 1 add value by giving them the ability to convert among different formats.

Atech Software has released the only Windows-based font conversion utility to date, and because it accommodates all formats users can protect their investments in other technologies.

The major font vendors are also voicing support for their primary font technologies in addition to supporting TrueType. Adobe, for example, is wont to carve out more of the Windows territory for its Type 1 and has so far managed quite well with Adobe Type Manager (ATM) for Windows.

Fresh from working with HP to develop Intellifont for Windows, Agfa/Compugraphic has published the specifications for its font technology in hopes of getting others to create Intellifont fonts. The foundry has committed to providing TrueType fonts and currently has a large

Type 1 library.

Bitstream, a vociferous TrueType supporter, plans on having its library of fonts in Type 1, TrueType, and Speedo formats. The company currently supports its own font management utility for Speedo under Windows called FaceLift. Monotype will also have a TrueType library, but it will continue to support its F3 format, which exists mostly on workstations.

**FONT FRENZY.** Still, as many pundits predicted, the introduction of TrueType will add to the confusion that already exists because it is one more format for vendors to support and users to understand.

However, Jesse Berst, publisher of the "Windows Watcher" newsletter, believes user confusion will be short-lived as long as vendors do users the service of becoming compatible with one another's technologies.

Oster agrees with this philosophy, but sees more in it for the vendors than for the users. "If Adobe doesn't offer its clients an ATM mechanism with TrueType, they can push their clients over to Microsoft," said Oster, who added that if HP were to support TrueType in its next version of PCL, then other competitors might drop out.

Others are hedging their bets that the plurality of font technologies will become less so in the next two years, leaving a precious few formats. "In two years tops, there will only be two formats," Harris said.

Despite all the confusion, the wide distribution of TrueType and the existence of all the other technologies will serve to educate users on fonts, if not test their patience. But, overall, the arrival of one widely distributed technology will provide a long-awaited solution to the font puzzle. □

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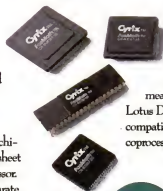
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## DOS APPLICATIONS

## DOS Apps Pay Performance Toll Under Windows

Windows Can Now Run Most MS-DOS Applications,  
But Some Managers Aren't Willing to Take the Chance

BY DAVID COURSEY

In desktop computing, users are capable of doing a lot of things, which on further reflection they may wish they hadn't. An example is erasing a mysterious file whose location you don't know. Another is running MS-DOS applications under Windows.

Granted, running MS-DOS applications is one of the most important features of Microsoft Windows, helping smooth the transition from character-to graphics-based applications. But managers can be particularly vexed by these transition issues. Should the move to Windows be delayed until every application is available or is it alright to leave a few old DOS applications on Windows machines? And what about specialty or custom applications that may never make the move to a graphical environment?

For the most part, Windows and DOS applications coexist peacefully. While the

versions of Lotus."

An investment banker at a major New York financial services firm said users at his company don't typically mix Windows and DOS applications, partially because Excel tends to be their only Windows program.

"In our group we spend more time using non-Windows applications than Windows," according to one user. "Users don't want to take the performance hit of running their DOS applications under Windows." His DOS applications run 20 percent slower under Windows, he said.

"What stops me from running DOS under Windows is that when you hit the icon you wait a while before getting a C: prompt. It seems just as quick to get out of Windows entirely," he said.

Ray Elseth, a consultant and director of on-line operations for WUGNet/The Windows User Group Network, in Palatine, Illinois, will set up clients to run DOS applications under Windows only if they strongly insist. "DOS applications seem to introduce UAEs, crashes, and instability," Elseth said.

"I don't have any big philosophical hang-ups [about running DOS applications under Windows]," Elseth said. "If a customer has to use WordPerfect, then we put up WordPerfect, but I believe it complicates my life," he said. "I might give them a copy of Word for Windows just to try to convince them to switch."

**SMOOTH SAILING.** At the other end of the spectrum are users who've had no if any problems. "I've had very good luck with all the DOS applications I've run under Windows," said Steve Gutterman, an MIS staffer at Ryder Auto Carrier Division, in Detroit.

Frank Berry, a computer security manager at the U.S. Transportation Command, believes the advantages of integrating data from DOS applications with Windows-based word processing, presentation, and personal information manager applications provides tremendous power.

"Since Windows is not yet approved software in my company, I have kept quiet about it, but it is the only way that I can run DCA's E78 3270 emulation software," said Roy Murphy of AON Corp., a Chicago insurance holding company.

As for performance problems, Murphy doesn't notice them because he doesn't generally run single-tasking DOS anymore, making Windows his standard for comparison. "Sometimes when I go out to stand-alone DOS, I'm surprised at how spotty Lotus is," Murphy said. Still, by multitasking several applications and moving between them, Murphy feels he gets more work done, even if some of the individual pieces are slower.

Users seem to go somewhere in the middle, moving toward Windows but holding on to some DOS applications and occasionally having trouble.

Performance is an oft-heard complaint, with many users reporting a 20 percent performance penalty for running DOS applications under Windows. But performance is controlled by many factors. Besides the processor speed and



available memory, Windows' configuration and whether the user has taken time to replace the temporary disk swap file with a permanent one affect performance. "On the whole, DOS apps — one at a time — run significantly slower under Windows," complains software developer Dean Gibson.

Microsoft is working to improve DOS performance as well as its documentation, Carlson said. He recommends that users pay special attention to the settings in the program information files (PIFs) Windows uses to configure itself to run DOS applications. But he admits the company's manuals aren't as helpful in this area as they might be.

**MEMORY HANGUPS.** Still other problems — mostly to do with memory — plague some users. "Windows appears to be very sensitive to memory," said George Feibish, president of ObjectSoft, a River Vale, New Jersey, software company that tests its DOS applications under Windows. "If you have any kind of a DOS app that's not freeing up memory, you don't get a warning and it crashes."

"A lot of old DOS [applications] think they control the whole machine and are just sitting there polling — looking for the user to press a key — and soaking up a whole bunch of processor cycles. Windows tries to solve this but doesn't succeed in all cases," Feibish said.

Feibish recommends a shareware program called Tame, written to deal with the polling problem. It is available in the Windows forums on CompuServe.

The memory problem can also be helped by removing your wallpaper — the image Windows displays on your desktop. Replacing wallpaper with a gray screen (one of the options in the Windows desktop control panel) frees a special type

of "system resource" memory that Windows needs to operate.

Feibish also recommends limiting the number of groups and icons in Program Manager as another way of freeing up resource memory, the availability of which is displayed by choosing the "About" option in the Program Manager help menu.

"It shows the percentage of 'free system resources.' When it gets down into the single digits, you're about to have a crash," Feibish said. "If you can't get a DOS application to load and the resources number is low, you may want to reduce the number of groups or get rid of your wallpaper in order to get the application started."

Low memory isn't the only problem for DOS applications. Another is Windows' general incapability of dealing with fast serial communications, a problem that may become worse when a DOS application is involved.

Software developer Dean Gibson learned about this the hard way when a shareware communications package dropped characters while running in the background under Windows.

"In the foreground I was using Reflex doing a large recalculation which was very CPU intensive," said Gibson of UltiMeth Systems, in Harbor City, California. "At the completion of the recalc, I went to the communications window and found that a significant portion of my messages were almost unreadable because of dropped characters."

There is no consensus on whether mixing Windows and DOS applications is really worth the risk of problems. But until DOS applications go away — which no one expects to occur anytime soon — DOS under Windows will remain a way of life for many Windows users. □

Many users report a  
20 percent performance  
penalty for  
running DOS apps.

"good old days" of Windows crashing DOS applications — or vice versa — are largely behind us, there are still occasions when Windows does strange things, using an "Unrecoverable Application Error" (UAE) message forcing the user to restart the system.

Most of the problem applications, a list of which at one time included WordPerfect, have been corrected, according to Ty Carlson, a Microsoft engineer charged with helping users move from DOS to Windows.

**AUT SAY NOT?** But not everyone is happy with that answer, and for a number of reasons — mostly related to user training — some PC managers aren't willing to mix DOS and Windows applications on the same machine. Some people, to overuse an expression, "just say no" to one of the other.

David Gleason, who calls himself the "de facto MIS director" of ARSO Radio Corp., in San Juan, Puerto Rico, simply avoids DOS applications altogether on the Windows systems he designs for radio station management. "Basically it's an issue of training," said Gleason, who only uses DOS utilities, like disk defragmenters, for which a Windows equivalent isn't available.

"There is no application category categorized that sophisticated that cannot be found under Windows," Gleason said. "It's faster to train new users [on Excel] than to train Lotus users on the new

## ON THE ROAD

# Using Windows on a Laptop Is No Longer a Drag

Barriers to Taking Windows on the Road Have Fallen,  
But Still Few Users Load Windows on Their Portables

BY NICO KROWN

**Q**uestion: What's smaller than a breadbox, computes data like a desktop PC, and isn't part of the Windows 3.0 craze? Answer: laptop computers.

Although sales of Windows 3.0 reached more than 3 million copies before its first anniversary, and market researchers say laptop PC sales jumped 24.3 percent in the first two months of this year compared to last year—in spite of a recession—few users have installed Windows on their portable computers.

But now, one year after Microsoft released Windows and six months after the first 386SX notebook-size computers arrived, several hardware and software companies see the sales potential of successfully combining Windows and laptops, and they are racing to overcome barriers to a happy union.

Until recently, running Windows on a portable system was more frustrating than it was productive. The bulk of laptop computers were 8086- or 286-based, and they ran Windows painfully slowly, if at all. Among the 286-based machines, many came with too little RAM and too small a hard disk drive to install Windows, let alone Windows plus a few applications.

But the advent of the 386SX-based notebook computer changed all that. Suddenly a flood of notebook PCs with 2 or more megabytes of RAM and optional 40- or 60-megabyte hard disk drives were everywhere. For the first time, it became possible to run Windows on a portable computer. Or did it?

There were still problems. The biggest was finding an input device suitable for a portable PC. (Of course, Microsoft is working on adding a pen-based interface to Windows, which would allow users to write on some touch-sensitive screens—but that product isn't expected to hit the market until late in the year or next year.) Another was remedying the problem of a disappearing pointer—a problem caused by the limits of computer display technology.

**WHAT, NO MOUSE?** Far and away the greatest deterrent to running Windows on laptops today is the input device, say industry analysts and users. Many users find dangling a mouse off the side of an airplane tray-table unacceptable. Others turn up their noses at trackballs. Still others figure you have to be triple-jointed to successfully operate hand-cramping alternatives to the mouse.

Toshiba is the world's largest seller of laptop and notebook-size computers, according to data collected by Storeboard Inc., a Dallas-based research firm. Unlike many other laptop PC vendors, Toshiba is "agnostic" on the subject of laptop input devices, not bundling any particular one with its systems, said Tom Martin, vice president of marketing for Toshiba America Information Systems Inc.'s Irvine, California, U.S. headquarters.

"The pointing device situation is

significantly a matter of taste," Martin said. "To date, we haven't found any pointing device that was widely accepted and could be built in."

"A lot of people would like to use what they use on the desktop—meaning the mouse. I think the necessity of anything beyond a mouse has been exaggerated. The percentage of use on an airplane is under 10 percent," Martin said.

Despite statistics supporting Martin's contention that few people actually use laptops on airplanes, a crush of vendors has recently introduced input devices intended to woo laptop users who have so far shied away from installing Windows. Even Microsoft and IBM have jumped on the bandwagon, though both have steered clear of esoteric technologies.

Compaq Computer Corp. of Houston has thrown its weight behind Microsoft Corp.'s recently introduced BallPoint, a trackball that attaches to the side of a portable computer. Compaq is bundling a free BallPoint with all its laptop and notebook computers until the end of June.

Logitech Inc. of Fremont, California, has developed a similar device called the TrackMan Portable Mouse, a \$169 trackball expected on the market in July. It also attaches to the side of a portable computer keyboard, eliminating the problem of tray-table space on a plane.

IBM Corp., upstaged by others in the laptop market until now, is also determined to make a mark in the small laptop and notebook-computer world and has recently introduced two lightweight machines, as well as the Trackpoint, a hybrid mouse/trackball device.

"I think the IBM Trackpoint is terrific," said Storeboard president JoeAnn Stahel. "For people like me who are so used to using a mouse, you can use it as a mouse. But on a plane you can use it as a trackball."

**ESOTERIC ALTERNATIVES.** Some users find the mouse an irksome device and say it's no better than trying to do calligraphy with a rock. While some mouse-haters don't mind trackballs, others say even the trackball misses the point because it forces them to look away from their screens.

Home Row Inc., a small company in Clackamas, Oregon, has developed an alternative that it sells to keyboard manufacturers. The Home Row technology is built into a single key on the keyboard—usually the J key—and users can point by applying pressure to the key. They can easily toggle back and forth between the keyboard as a pointing device and using it for regular input.

"When people first try to use it, they find it a little hard to use," conceded David Strayer, Home Row president. "But the productivity improvement is so great that once you get over the learning curve, you'll love it."

Mark Eppley, chairman and CEO of Traveling Software Inc., a Bothell, Washington, firm that makes the laptop



program Laplink Plus, is an avid proponent of Home Row technology because users never have to remove their hands from the keyboard. He thinks such technology may eventually supplant mice and trackballs on desktops.

Since its development, Home Row has licensed its technology to Key Tronic Corp. of Spokane, Washington, one of the largest U.S. keyboard manufacturers; Mitsumi Electric Co. Ltd., a Tokyo firm that builds keyboards for Compaq; and Se-Jin Electron Inc. of Seoul, Korea.

Another alternative is the Isopoint device, found on Outbound's Mac-based portable and Grid Systems Corp.'s 1550SX. The Isopoint is a long rolling cylinder built into the keyboard below the spacebar. Unlike other alternatives, the Isopoint moves in a perfectly straight vertical, horizontal, or diagonal line. "I've used the Isopoint, and I find it easier to use than a trackball," said Bill Lempiess, the Pleasanton, California, publisher of the *Lempiess Report*. "If you've ever tried highlighting text with a trackball, it's not fun."

Another option, however, is a touch-screen. The Datelink notebook PC, from MicroSlate, uses a touch-screen LCD. The product will be compatible with both Microsoft Pen Windows and PenPoint, Go Corp.'s pen-based operating system.

**THE DISAPPEARING POINTER.** Another obstacle to running Windows on laptops is the state of display technology. The screen pointer users take for granted on their desktop machines disappears on a laptop equipped with a liquid crystal display, because LCDs aren't refreshed often enough to maintain fast-moving

objects like pointers.

One solution is a gas plasma display, but so far few manufacturers offer gas plasma displays on 386SX-based notebooks. And gas plasma technology has a downside, too: the gray-scale effect that makes Windows attractive is lost.

Active matrix displays solve the disappearing pointer problem, but are costly to produce because they involve putting close to a million transistors on a sliver of silicon. Only Apple uses an active matrix monochrome display on a portable.

**WHO NEEDS WINDOWS ANYWAY?** For many users, running Windows on a laptop simply isn't relevant. Some look at their laptops as utilitarian buckets used only to sleep documents and spreadsheets home when they need to put in extra hours, or to use on occasional road trips.

"I don't think there's an overwhelming desire to use run Windows on notebooks yet," Lempiess said. "If you just use one or two apps, do you really need Windows at all? I don't cut and paste between multiple applications. I think the average user is still pretty untasking," he said.

Michael Rosenfield, manager of labor relations for Walt Disney Pictures and Television in Burbank, California, said he only uses a few applications on his Toshiba T3200SCX. Although he uses Windows when he runs the applications, he exits to DOS and uses his computer to download documents from large networks. Even when he runs Windows, he avoids keyboard input devices. "I prefer to use the Ctrl-F and Ctrl-G commands, because I'm familiar with them, and for me it's faster." □

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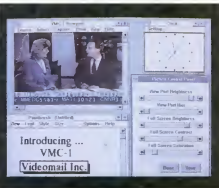
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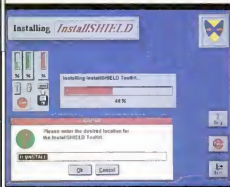
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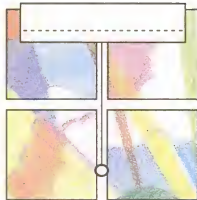
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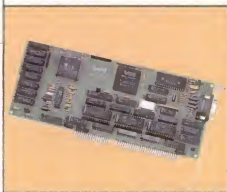
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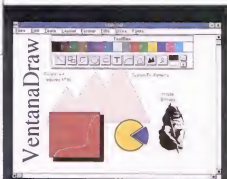
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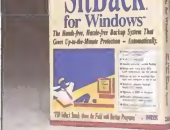


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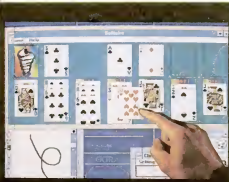
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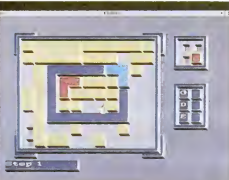
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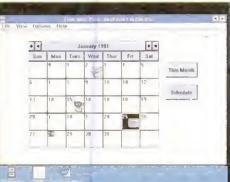
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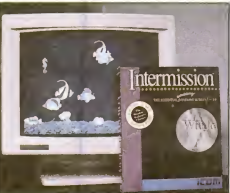
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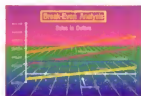
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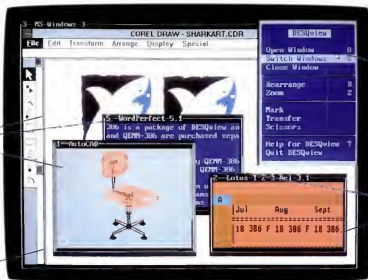
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# INFO WORLD

## FROM THE EDITOR

### System 7 Is a Big Step in the Right Direction

Even if you're not a Macintosh user, Apple's announcement last week that it was finally shipping Mac System 7 — the latest revision of the Macintosh operating system — can only be seen as good news.

It is obvious why all this is important to Macintosh users, but why should users of other platforms care? They should care because so many applications are now written for multiple platforms, including the Macintosh, Windows, and OS/2, and because System 7 makes the Macintosh environment more competitive in some ways and more advanced in others.

This, in turn, should lead some developers to exploit the things that the Macintosh does best, and other developers to finally start taking advantage of the features that are now in all of the environments.

System 7 advances the state of the Macintosh in several important ways. With Apple-Events and InterApplication Communication, Macintosh applications finally have a more advanced way of communicating with one another. The Mac pioneered the Clipboard, but never really had the kind of links that Windows applications now have through Dynamic Data Exchange (DDE). Now it does.

System 7 takes this one step further with Publish and Subscribe, which make it easier to share information over a network. These features offer the possibility of distributing applications over a network to take the best advantage of your hardware. And network ac-

cess is further enhanced through the inclusion of the Data Access Language as part of the system. Both of these offer a lot of potential for networked applications; we're still waiting for similar features in DOS or Windows.

Apple has been known for ease of use, and System 7 continues in this tradition. Balloon help may be useful for new users, True Type will make fonts easier for people who otherwise wouldn't have paid much attention, and the tutorials included with System 7 are a step in the right direction.

One very impressive detail is the "Before You Upgrade" disk that examines your system for possible compatibility problems before you install System 7. In a perfect world, of course, all applications would run immediately, but at least this helps people know what's going on.

Sure, there are things you could ask for that are not in System 7, such as true multitasking for multiple communications sessions (such as in OS/2 or Unix) or object-oriented technology for dragging applications inside other applications (such as in NewWave).

But System 7 was a long time in coming, and seems to be a big step in the right direction. It will force all developers to pay more attention to things such as ease of use, easier network access, and the ability to let applications be used as building blocks. Let's be glad that we've finally gotten these features; and leave the rest for the future.

— Michael J. Miller

## TO THE EDITOR

### A Little Bit Incorrect

In his letter to the editor, "Too Much Knowledge" (April 29, Page 49), Richard Bialac remarks that "in the words of William Shakespeare, 'A little bit of knowledge is a dangerous thing.'"

To avoid that peril himself, Mr. Bialac should know that the phrase he wants is not Shakespeare, but rather in Alexander Pope's *An Essay on Criticism*: "A little learning is a dangerous thing/Drink deep, or taste not the Pierian spring."

Ethan Place  
Palo Alto, CA

### The Beef's in the Column

Ruthann Quindlen's column in the April 29 issue ("Where's the Beef in Industry Complaints Against Microsoft," Page 86) is the best she's ever written.

I could not agree more with her. Apple Computer did indeed rest on its laurels for years and System 7 should have been released at least a year, probably two years ago.

Here is Apple, supposedly a different kind of company, with a Macintosh system that has only been incrementally upgraded since its original creation more than six years ago.

Where has it been? Other than HyperCard, what has it been doing? Where is

the continuing innovation that would have kept Apple's operating system far ahead of Windows? Apple has no one to blame but itself for its current industry position.

As for the Federal Trade Commission probe, Quindlen is right on target. I don't like much of Microsoft's behavior, but facts are facts, and Microsoft is where it is because of the quality of its products more than anything.

While the Japanese government helps Japanese companies, why is it that our government seems to spend most of its time throwing up roadblocks for U.S. companies?

Who has Microsoft hurt? Certainly not consumers. Its competitors? Well that is competition, isn't it? Microsoft does not seem to have prevented Borland from flourishing, though it is in direct competition with Microsoft on several fronts.

It is time that software companies rethought their policies and spent more time on the quality of their products and support. They should spend as much money on finding out how to better serve their customers as they do on lawsuits against each other.

I think it's time our legislators started actually doing their jobs by addressing the copyright, patent, and trade practice situations that are helping to stifle American competitiveness rather than help it.

Are we really too stupid to learn from

what the Japanese are doing right?

Jordan Powell  
Danbury, CT

### Corrections

In the pipeline "Apple, Aldus, and Adobe Join AISB" (May 6, Page 52), an incorrect phone number was printed. AISB's number is (800) 962-9480.

An item on Okidata's ML380 printer ("Okidata Reduces Price of 24-Pin Printer," April 29, Page 29) should have said the print head assembly was rated at 200 million characters. Okidata's phone number is (800) 654-3282.

In the May 6 story "Right Hand Man II Brings Sound to E-Mail Messages" (Page 41), we incorrectly identified Futur-us Inc. as the first third party to use Artisoft's voice adapter. Futur-us is the first third-party company to use the Artisoft adapter for E-mail, but the first company to use the voice adapter as part of a product is Voice It Inc.

Please write to Letters, InfoWorld, 1060 Marsh Road, Menlo Park, CA 94025; (MCI Mail: 259-4127; CompuServe: 73267.1537; or The Source: TX939). Letters can also be faxed to (415) 328-1049. Include your name, address, and daytime telephone number. Letters selected for publication will be edited for length and clarity.



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## Aviation Systems, Vol. II

### Chapter 127: Retractable Landing Gear

#### Prevent Systems

Nose-wheel spin-up system is actuated (see Figure 127.17) when switches complete circuits to energize DC-powered gear-control valve



Typical aircraft on ground in gear-retracted mode

solenoid upon depression of gear-control handle. (See Chapter 98: Main Cockpit Controls.) Main gear squat switch engages solenoid to retract spring-loaded plungers controlling hydraulic and pneumatic (1800 psi) extend and retract ports providing triple redundancy indicated by pneumatic and hydraulic pressure-on annunciators on control panel left of CD player.

#### Prevent Systems

It is generally regarded as quite imprudent to place landing gear in retract mode while airplane is taxiing or parked on tarmac or other ground surfaces. Many aircraft models have installed prevent systems locking gear in extend mode while parked. However, even with these models, premature retraction is still possible under certain conditions and can result in severe damage to landing

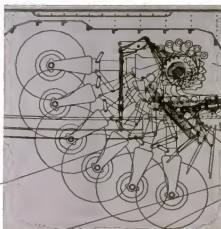


Figure 127.17. Nose-wheel spin-up articulation.

Table 127.5. Landing Distances

LANDING WEIGHT IN POUNDS			
4,000 lbs	5,000 lbs	6,000 lbs	7,000 lbs
60-100 meters	60-100 meters	60-100 meters	60-100 meters
70-100 meters	70-100 meters	70-100 meters	70-100 meters
80-100 meters	80-100 meters	80-100 meters	80-100 meters
90-100 meters	90-100 meters	90-100 meters	90-100 meters
100-100 meters	100-100 meters	100-100 meters	100-100 meters
110-100 meters	110-100 meters	110-100 meters	110-100 meters
120-100 meters	120-100 meters	120-100 meters	120-100 meters

Assumes mean altitude of sea level at 1000', mean humidity of 60%, mean temp. 21°C. Distances may vary according to surface condition. Subtract 20% for unpaved surfaces.

Source: Landing Gear Subsystems Council.

Page 1023

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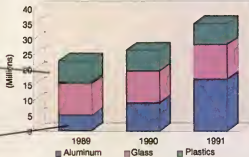
The Materials Research Group Recommendation:

### FOCUS Aluminum

This study conducted by the Materials Research Group provides the basis for our most recent recommendation that WeCycle continue to expand its aluminum recycling capacity by another 70% over the next 6 years. The graph to the right shows the increasing proportion of our business provided by the aluminum division during the past three years, now approximately half of all revenues. It is our opinion that, at this rate of growth, aluminum recycling will continue to offer our company its greatest opportunity for expansion over the next decade, and certainly into the 21st century.



Gross Revenues by Product



WEecycle PRODUCT	1989	1990	1991
<b>Aluminum</b>			
East	2,323,428	4,019,527	7,315,539
Central	1,372,347	2,374,160	4,320,972
West	1,728,492	2,988,831	5,436,033
Total	5,422,265	9,380,518	17,072,544
<b>Glass</b>			
East	2,496,721	2,587,821	2,796,925
Central	3,598,757	3,217,693	3,507,285
West	4,217,635	4,471,294	4,873,710
Total	10,313,113	10,256,808	11,179,920
<b>Plastics</b>			
East	2,897,493	3,171,243	3,234,668
Central	1,873,936	1,823,697	1,860,171
West	2,378,942	1,987,421	2,006,769
Total	7,150,373	6,962,361	7,101,608

### Glass and Plastics

As can be inferred from the graph to the left, glass and plastics recycling has been holding steady throughout this same period, and has consequently become a smaller proportion of our overall sources of revenue.

Although this group would strongly recommend that WeCycle Waste Corporation do all that is necessary to increase its activities in these areas, our studies have shown that aluminum will become increasingly the material of choice in the shipping, heavy manufacturing and container industries.

### Aluminum

It is our opinion that sources of aluminum products will be pressed close to their limits over the next decade.

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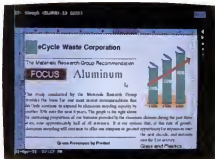
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We've also added new features you won't find in other spreadsheets. Like the



With its WYSIWYG graphical environment, you can do all your formatting "live" on screen.

Viewer (based on Lotus Magellan® technology) which helps you find the file you want before retrieving it. And a very helpful Auditor that simplifies the job of documenting and analyzing complex worksheet logic.

Of course, you won't just like what Release 2.3 does. You'll like how it feels.

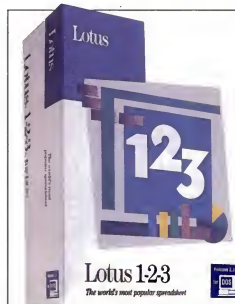
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Along with 96 type style combinations, new 3D-effect graphs, drawing and annotation tools, and the most font support, choices of colors and shading available.

Compatibility? As with any 1-2-3 product, it's no problem. Because Release 2.3 will read all of the files you've created on previous versions of 1-2-3, including files you've formatted using Always™ and Impress™. So you'll preserve all your work, as well as your training.

For more information about the new Release 2.3 or for upgrade details, call us today at 1-800-TRADE-UP, ext. 1091.



## What's New In Lotus 1-2-3 Release 2.3.

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- Auto Compress, for a trouble-free way of making larger worksheets print on single page
- Dialog Boxes for an easier, more interactive way of working
- Text-editing for easy on-sheet word processing, including automatic word wrap, even around graphs
- The Auditor for documenting or highlighting your spreadsheet logic
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# PRODUCT COMPARISON



## Network Backup: You Know You Need It

*InfoWorld looks at six DAT drives for gigabyte-size storage capacity.*

BY CARLA MATHEWS ASSOCIATE REVIEWS EDITOR

PETER SCHULZ REVIEW BOARD

ZOREN BANAPOUR AND LINDA SLOVICK TEST CENTER TECHNICIANS

BRETT GLASS CONTRIBUTING EDITOR

**B**acking up network data may be the single most important security measure a company can take. How well it's done can make the difference between disaster and a smooth operation.

Whether a backup is used to restore a crashed file server or bring back a single file for a careless user, network administrators favor devices that make their jobs easier — and safer. In the best of all worlds, a backup program not only handles tricky files (such as Novell binderies) and batch-file automation (so backups can take place overnight), it provides detailed backup reports, juggles open files with aplomb, and tracks as much of your day-to-day backup needs as possible. If you're lucky, a cataloging feature makes finding backed-up files easier. If you're really lucky, your backups are fast.

**DAT'S WHAT YOU WANT.** Tape drives are the most popular PC network backup device. A variety of drive and tape types are available, ranging in capacity from 30 megabytes to more than 10 gigabytes.

An *InfoWorld* survey of 1,000 readers showed more people currently use QIC (quarter-inch cartridge) tape drives for network backup. However, more respondents wanted to see DAT (digital audio tape) drives reviewed. We comply with a comparison of six external 4mm tape drives on a Novell network.

Each vendor here bundles its own software with hardware supplied from one of a half-

dozen DAT drive manufacturers. Palindrome's The Network Archivist is the only software that can be used with other backup devices. Palindrome also offers the most sophisticated backup and restore techniques, including file migration and automatic tape rotation. Such backup management for networks can be invaluable, and most vendors are working to provide at least some form of it.

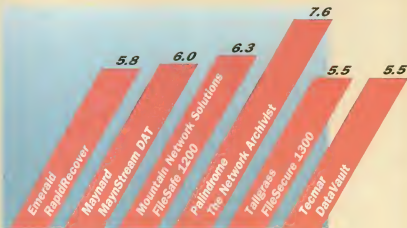
All the drives use 1.3-gigabyte-capacity DAT cartridges. Tallgrass and Tecmar can double that with compression. Tecmar and Maynard will be able to use the new extended-length (90-meter) tape when that new medium ships. All but Palindrome let you daisy-chain drives for greater capacity. Mountain sells a dual-bay DAT drive.

All these drives use a DDS (digital data storage) standard format. A new DAT standard format, DAT/2, is expected to eventually become more common than it currently is. (See sidebar, Page 138.)

DAT is gradually moving toward a smaller footprint; 3½-inch form factors in vertical enclosures make the Maynard and Palindrome drives the most petite in this group.

Because it's a more common configuration, we ran our tests with each of the drives attached to a workstation, rather than the server. The issue of workstation- vs. server-attached drives divides the network backup community, as noted in "The Great Debate: Server-Based vs. Workstation Backups," Page 138.

### THE SCORES



### EXECUTIVE SUMMARY

**A**t a minimum, all of these tape backup subsystems offer a respectable range of options for backing up and restoring your workstation hard drive and multiple network servers.

It's by far the most expensive (\$6,985 supports unlimited backup capacity), but Palindrome's The Network Archivist still takes top honors for its unique database handling of backup, archiving, and restore chores. No other combination of backup drive and software comes close to completely automating network backup the way TNA does. It's also fairly fast and the vendor implements generous support policies.

A mysterious error message forced us to reformat one of our TNA packages. This unit, too, balked, then the problem went away, seemingly on its own.

With its free peer-to-peer software (for backing up all other local hard drives from a workstation), reasonable speed and price (\$5,995), and Macintosh file support, Mountain Network Solutions' FileSafe 1200 is a good choice for DAT backup.

We apparently ran into some type of hardware conflict with Maynard's MaynStream DAT; one unit gave us the most installation problems of all the drives. After some tinkering by a Maynard-provided technician, the drive ran fine.

Priced identically to the FileSafe 1200 (\$5,995), the MaynStream also offers peer-to-peer software and supports the Macintosh. It throws in a tape librarian, file grooming capability, and great support. It's on the slow side, though.

Software for Emerald's RapidRecover, also

\$5,995, operates only under Windows and only in real mode. Even so, we had problems getting it to work with our full Windows 3.0 software; it did fine with the supplied run-time Windows 2.1. The next release will work with standard and enhanced Windows modes, according to Emerald.

The RapidRecover's EmSave software teamed with EmLib, a tape library management package, provides a comprehensive backup and restore system. RapidRecover is fast, but may be gaining speed from lack of a file-compare feature. Nevertheless, if you want a backup/restore system designed for Windows, RapidRecover is your choice.

Tallgrass' FileSecure 1300 and Tecmar's DataVault tied in their final scores.

At \$4,595, the FileSecure 1300 is by far the least expensive unit we looked at. It's also rather slow. The FileSecure would have a place in a cost-conscious office, however. Like TNA, it doesn't yet support the Macintosh, but it is one of only two drives here to implement data compression — DAT's next step toward offering even more storage capacity.

Used with Tecmar's simple workstation-based software, QT, the DataVault is the second least expensive system (\$5,490).

QT is easy to set up and use and offers most basics (including outstanding vendor support), plus Macintosh support and a file compression capability. However, it's lean on extras, missing such features as password protection and searching capability. The DataVault is also the slowest unit reviewed here.

According to Tecmar, the DataVault's forte lies in server-based backups (using the vendor's ProServe software.)

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**DAT TO THE RESCUE.** DAT drives came along at an opportune time. The credit-card-size cartridge was originally created for the high-end consumer electronics market in 1986. It migrated to computers a couple of years ago when users found themselves facing a gap between 150-megabyte quarter-inch cartridges (QIC) and multigigabyte 8mm tape drives. Using helical-scan technology to fit 1.3 gigabytes on a 4mm (0.16-inch-wide) tape, DAT was the perfect small-footprint backup solution for large networks.

Since then, DAT has found a place in most tape backup product lines. However, it's facing an increasingly competitive environment. Eight-millimeter drives, which tend to appeal to a different market, are not much of a threat. (See sidebar, Page 136.) But the older QIC technology may be about to give DAT a run for its money with new 525-megabyte and 1.35-gigabyte units, which are just beginning to ship.

**BIGGER IS BETTER.** QIC proponents brag that not only are their drives cheaper, but the cartridge

capacity will steadily expand until a 12-gigabyte tape ships in 1995. All the high-end formats, though, including 4mm and 8mm, are moving up in capacity. Using compression or the 90-meter cartridge, DAT now offers 2 gigabytes. According to Ar-DAT, it will soon ship a drive that combines the new tape length with hardware-embedded compression capabilities for up to 8 gigabytes of storage.

As for cost, those who favor DAT say its high hardware prices will gradually shrink as more drives are sold. Currently, DAT drives list for several thousand dollars more than the new 1.35-gigabyte QIC drives. However, you can find some DAT cartridges with street prices below \$20, compared to about \$40 for QIC cartridges. This is because DAT cartridges are much less the engineering marvel than QIC tapes.

**NOT SO FAST.** Both QIC and DAT backers tout optimum speeds far above what the average user will achieve. Theoretically, QIC drives can operate at about 14 megabytes per minute, compared to about 10.8 megabytes

per minute for DAT.

However, different platforms, networks, adapter cards, and software result in rather wide speed variances. In our July 23, 1990, (Page 51) comparison of 40- and 80-megabyte QIC drives, Tallgrass FileSecure 80 clocked in the fastest at 5.83 megabytes a minute. In this comparison, the Palindrome DAT drive backed up at 4½ megabytes a minute.

QIC backers are quick to point out that DAT lacks QIC's strong standards and backward compatibility. Time will take care of the latter — DAT needs only a few product iterations under its belt before it can boast its own backward compatibility within a specific drive family. Because of industry fragmentation over standards, it's true that DAT cartridges are not interchangeable between different vendors' machines. However, neither are the higher end QIC formats.

*Peter Schultz is a consultant who specializes in systems-level software and utilities, drivers, networking issues, and languages for the PC arena.*

## The Network Archivist Takes the Pain Out of Backing Up Your Network

**B**acking up and restoring files on a network doesn't get much easier than with Palindrome's The Network Archivist. TNA considers files as either evolving or stable. It backs up evolving files — ones that change on a regular basis — as they are changed. It archives stable files — the ones that have not changed for a set period of time, six weeks being the default. Once a stable file has been "fully protected," (at least three copies of the file are on tape), TNA will not back it up any more.

TNA also protects against disasters by managing off-site vault storage of tapes. When a tape is ready to go off site, TNA selects it and notifies the operator. TNA also gives the operator an advance warning when an off-site tape will be needed for an upcoming operation.

You don't need to worry about the nuances of the rather complicated mathematical model TNA uses to determine tape rotation. In fact, "horizons" — the period of time a file will still be on tape somewhere and available for restoring should it be needed — are virtually impossible to manage manually. TNA always tells you which tape to mount for the next operation, whether it is a backup or restore.

Another problem in storage management is maintaining disk space. As time passes, files accumulate. If they are never used, they wind up taking valuable space. For this, TNA (and Rapid-Recover and MaynStream, to lesser degrees) provides a "disk grooming" capability. With the operator's permission, it will remove data files that have not been accessed for a period of time (12 weeks being the default) and that are fully protected on tape.

— Peter Schultz

### REPORT CARD

#### 4mm DAT Drives

	(InfoWorld weighting)	(Your weighting)	Emerald RapidRecover	Maynard MaynStream DAT	Mountain Network Solutions FileSafe 1200	Palindrome The Network Archivist	Tallgrass FileSecure 1300	Technar DataVault
			Version 3.1	Version 3.0	Version 5.1.2	Version 1.8c	Version 1.44	Version 1.2
<b>List Price</b>			\$5,995	\$5,995	\$5,995	\$6,985	\$4,595	\$5,490
<b>Performance</b>								
Backup	(125)	( )	Satisfactory	Good	Good	Excellent	Satisfactory	Satisfactory
Restore	(150)	( )	Very Good	Good	Satisfactory	Excellent	Satisfactory	Satisfactory
Speed	(75)	( )	Very Good	Satisfactory	Satisfactory	Good	Satisfactory	Poor
<b>Documentation</b>	(100)	( )	Good	Satisfactory	Very Good	Satisfactory	Satisfactory	Good
<b>Setup</b>	(100)	( )	Satisfactory	Satisfactory	Good	Satisfactory	Satisfactory	Satisfactory
<b>Ease of Use</b>	(150)	( )	Satisfactory	Good	Good	Very Good	Good	Satisfactory
<b>Serviceability</b>								
Workmanship	(75)	( )	Satisfactory	Good	Good	Good	Satisfactory	Very Good
Support policies	(50)	( )	Very Good	Excellent	Excellent	Excellent	Good	Excellent
Technical support	(75)	( )	Satisfactory	Satisfactory	Very Good	Very Good	Very Good	Very Good
<b>Value</b>	(100)	( )	Satisfactory	Good	Good	Very Good	Good	Satisfactory
<b>Final scores</b>			<b>5.8</b>	<b>6.0</b>	<b>6.3</b>	<b>7.6</b>	<b>5.5</b>	<b>5.5</b>
Use your own weightings to calculate your score								

### GUIDE TO REPORT CARD SCORES

InfoWorld reviews only finished, production versions of products, never beta test versions.

Products receive ratings ranging from unacceptable to excellent in various categories. Scores are derived by multiplying the weighting (in parentheses) of each criterion by its rating, where:

**Excellent = 1.0** — Outstanding in all areas.

**Very Good = 0.75** — Meets all essential criteria and offers significant advantages.

**Good = 0.625** — Meets essential criteria and includes some special features.

**Satisfactory = 0.5** — Meets essential criteria.

**Poor = 0.25** — Falls short in essential areas.

**Unacceptable or N/A = 0.0** — Falls to meet minimum standards or lacks this feature.

Scores are summed, divided by 100, and rounded down to one decimal place to yield the final score out of a maximum possible score of 10 (plus bonus). Products rated within 0.2 points of one another differ little. Weightings represent average relative importance to InfoWorld readers involved in purchasing and using that product category. You can customize the report card to your company's needs by using your own weightings to calculate the final score.

Products receive InfoWorld Buyer's Assurance seals if they meet the following conditions: Software vendors must offer 90-day money-back guarantees on the products, and hardware vendors must offer a one-year repair or replacement warranty. No product is eligible that receives a score lower than satisfactory in any of our Report Card categories. Vendors who qualify have signed contracts with InfoWorld that detail these support policies. InfoWorld awards the Recommended seal to products that, in addition to the above criteria, receive a Report Card score of 8.0 or higher.





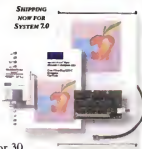
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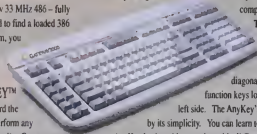
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- 1 Parallel/2 Serial Ports
- 101 Key Keyboard
- Microsoft Mouse
- MS DOS 3.3 or 4.01
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- 4 MB RAM
- 1.2 MB 5.25" Drive
- 1.44 MB 3.5" Drive
- 200 MB 15ms IDE Drive with 64K Multi-Segmented Cache
- 16-Bit VGA with 1 MB
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- Microsoft Mouse
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- Intel 80486 Processor with Co-Pro and 8K Internal Cache
- 64K Cache RAM
- 8 MB RAM, Expands to 64 MB
- 1.2 MB 5.25" Drive
- 1.44 MB 3.5" Drive
- 200 MB 15ms IDE Drive with 64K Multi-Segmented Cache
- 16-Bit VGA with 1 MB
- 14" Crystal Scan 1024NI
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## 4mm DAT DRIVES

**W**e ordered two sets of each of the tape backup subsystems in this comparison. To look at features, we connected one unit to a 16-MHz 386SX workstation equipped with 5 megabytes of RAM, a 150-megabyte ESDI hard drive, and an EGA display. This workstation was connected via Ethernet to two file servers, one operating under NetWare 3.10 and the other under NetWare 2.15C.

To test speed, we connected the second unit to a mini-network consisting of a server and one workstation. The server was a 20-MHz Compaq 386/20e server running on NetWare 286 2.2 and equipped with a 110-megabyte hard disk and 8 megabytes of RAM. The workstation was a 20-MHz Compaq 386/20e using Compaq DOS 3.31, a 40-megabyte hard disk, and 4 megabytes of RAM.

Criteria and weightings are based in part on an *InfoWorld* survey of 1,000 readers who use or are responsible for purchasing tape backup systems.

### PERFORMANCE:

Performance is divided into three categories: backup, restore, and speed.

**Backup:** Scores were based on the smoothness of backup operations and the variety of options available to select files for backup. At a minimum, we looked for what are now considered basic capabilities, such as backing up Novell bindery files and operating from batch files or scripts. We boosted the score for extra capabilities, such as backing up all local hard disks.

**Restore:** As with backup, scores were based on how smoothly operations proceeded and the variety of options.

**Speed:** The grade for speed was based on four benchmark tests designed to approximate everyday network backup and restoration tasks. We timed how long it took each drive to back up the entire server, restore a lost directory, back up modified files, and restore a modified directory.

In backing up all the server data (73 megabytes), we enabled any option that compared backed up files with the files on the hard disk. (The RapidRecover is the only package here that does not offer any type of Compare feature.) We did not enable any Verify function (to verify that the media are readable).

For the second benchmark test, we deleted 4½ megabytes of data consisting of all the files in a server directory and the directory itself. We then timed the restoration of the directory and all its files.

We set up our third benchmark test by modifying files containing 410K of data in two directories. We timed the backup of the modified files. We did not have the software overwrite any old tape backups of these files.

Our last test illustrated how easily and quickly the drives could restore an accidentally deleted directory that contained a few modified files. We deleted the same directory used earlier; this time, however, it contained both changed and unchanged files. All the products but Paladin's The Network Archivist made us restore the two types of files manually, in separate procedures. In

See How We Test, Page 132

## RapidRecover Version 3.1

**E**merald Systems' RapidRecover subsystem consists of a Wang DAT 5½-inch drive in a horizontal box. In addition to Emerald's Windows backup software, EmSave, and built-in library file manager, EmLib, the kit comes with a 16-bit SCSI adapter card (it also supports Compaq and Hewlett-Packard Co. SCSI adapters) and a run-time version of Windows 2.1. You can use your own copy of Windows, but Emerald's software will operate only in real mode.

EmSave supports Macintosh files on a NetWare file server. You can attach RapidRecover to your server using EmQ, an extra-cost (\$1,295 for NetWare 386, and \$795 for NetWare 286) software package that also lets you back up all the other local hard drives on your network.

EmSave lets you select files for backup in numerous ways, ranging from selecting an entire volume to backing up files that have been modified within a specified time span.

One interesting feature is useful for keeping sets of files at the same revision level. You can group up to eight files, and all of them must be available for backup or none of them will be backed up.

EmSave has an idiosyncrasy that's described in the release notes and will have to be carefully avoided. If you have mapped two drives to a volume, EmSave will always use the first mapping to back up that volume. If that first mapping does not include the root of the volume, you will back up only a small portion of the volume instead of all of it. The program gives no warning that this is taking place.

**Score: Satisfactory.**

EmLib lets you manipulate and search the shared database files created by not only EmSave and EmQ but Emerald's software for QIC drives, EmQIC. Using EmLib you can search for file names (including wild cards) across tapes and save sets. You can also locate files by the dates and times they were created.

The program displays all volumes contained on a tape. You may then select an entire volume for restoration or, similar to the backup operation, pick and choose individual files and directories to be restored. **Score: Very Good.**

Emerald's RapidRecover consistently lived up to its name in our benchmark tests. It was the fastest drive at restoring the unmodified directory and second fastest at all other operations.

However, one reason for this may be that it does not have a byte-for-byte compare function (to verify that copied files are the same as the originals).

**Score: Very Good.**

See RapidRecover, Page 132

## MaynStream DAT Version 3.0

**M**aynard's MaynStream DAT package bundles easy-to-use menu-driven software with a 3½-inch drive and enclosure manufactured by ArDAT, its sister company, and a proprietary 16-bit half-length SCSI adapter. Eventually, Maynard will resell ArDAT's new Python series of DAT drives, designed with data compression capabilities in the hardware. In the meantime, Maynard's hardware will accept the new extended-length 90-meter DAT tapes for 2 gigabytes of capacity.

The MaynStream also comes in internal configurations for AT and 386 systems (\$5,495), and internal and external units for portable P5/2s (\$5,695 and \$6,195, respectively). The drive can support the Mac and OS/2.

### PERFORMANCE: BACKUP

MaynStream offers image (bit-by-bit) backup and a variety of selection options for file-by-file backup. You can choose whether to include hidden and system files and whether a file's modified bit will be changed. Advanced users can use the command line to set up elaborate customized backups.

A Transfer menu option lets you delete files that were transferred to tape, freeing up disk space. You can program specific instructions at the command line for automatic transfers as often as you want.

You can automate your backup chores with scripts. In addition, the included IsleLAN and MaynLAN software lets you back up as many workstations as you like. **Score: Good.**

MaynStream offers plenty of restore options as well. You can restore an entire tape, an entire backup set, or select specific files from a backup set. You can specify whether read-only or modified files on your disk are overwritten. A tape-library feature lets you catalog backups so you can quickly locate the file you want.

However, image restores are all or nothing; you cannot restore file by file. **Score: Good.**

### PERFORMANCE: SPEED

The MaynStream was by far the slowest at restoring our 4½-megabyte directory (taking about 15½ minutes), but it was the fastest at backing up the modified files.

According to the vendor, the next MaynStream release will have a fast-file restore feature for taking advantage of DAT's inherent fast-search capabilities (200 times the read speed).

**Score: Satisfactory.**

See MaynStream DAT, Page 132

## FileSafe 1200 Version 5.1.2

**M**ountain's FileSafe 1200 half-height subsystem consists of a WangDAT tape drive in a vertical enclosure. Mountain supplies its own proprietary 16-bit SCSI adapter card and a no-frills menu-based software package. The vendor supports Adaptec adapters for use with third-party software, such as Cheyenne's Arcserve and Paladin's The Network Archivist.

The FileSafe supports Macintosh files on a NetWare file server. Mountain sells an OS/2 software package for \$179.

You can purchase an internal version of the FileSafe for \$5,495. MicroChannel versions are \$5,595 for an external drive and \$6,095 for an internal. Mountain also sells a dual-bay configuration, the FileSafe 1200d, for \$9,995.

FileSafe can back up and restore all network binderies, rights, and trustees. You can make image, file-by-file, and several different types of modified backups. You can choose files by tagging them, using the wild-card method, and using "ands" to exclude certain files from all directories.

The FileTalk software package, available free by returning a card, lets you back up all of your other workstations' drives as well. **Score: Good.**

Mountain offers three restore methods: Full, Selective, and Redirect. Full restores an image backup, and Selective Restore brings back individual files from selective or image backups.

A Redirected restore lets you restore files to directories other than the ones from which they originated.

**Score: Satisfactory.**

Mountain maintained a middle-of-the-road performance in our speed tests. Neither the slowest nor the fastest, it gave us respectable times for backing up and restoring our complete drive and selected files. **Score: Satisfactory.**

See FileSafe 1200, Page 132



**Network Archivist**

Version 1.8C

**P**alindrome's unique software, The Network Archivist (TNA), is probably better known than any hardware it is paired with. Like tape rotation on mainframe systems, TNA tracks tapes using an internal database that automatically monitors not only backups and restores, but tape and vault rotation and disk grooming (see sidebar on page 124).

Palindrome's DAT hardware consists of an ArDAT 3½-inch form-factor drive mounted in a small tabletop box. The base system comes with a cable, an 8-bit Future Domain SCSI host adapter, one 1.3-gigabyte DAT cartridge, a cleaning cartridge, and support for 350 megabytes. For more storage capacity, you have to buy additional expansion disks. The base internal version lists for \$4,595.

**FileSecure 1300**

Version 1.44

**T**he FileSecure 1300 system consists of a Wangtek full-height, 5¼-inch DAT drive in a vertical enclosure. A Tallgrass proprietary 8-bit SCSI one-third-length adapter is included, along with a straightforward menu-based software package.

An internal, half-height FileSecure lists for the same price. The units also support Adaptec adapters.

**DataVault**

Version 1.2

**T**ecmar markets its 4mm DAT drive, the DataVault, primarily for server-based backup with OS/2 workstations. For this you must purchase the ProServe software as a VAP for \$995 (for NetWare 286) or as an NLM for \$1,695 (for NetWare 386). However, you can use Tecmar's basic QT (Quality Tape) menu-driven software to attach the drive to a workstation.

The DataVault, a full-height 5¼-inch drive mounted in a vertical enclosure, is manufactured by Tecmar's sister company Wangtek (both are owned by Rexon). QT and a 16-bit Adaptec SCSI adapter card come in a separately sold package.

The software supports Mac files. An internal version of the DataVault costs \$4,695.

**Summary**

**F**or backing up all other workstations, most of the packages here either come with peer-to-peer software or sell it as an add-on.

Maynard's included IseLAN and MaynLAN software let you back up an unlimited number of workstations. You can get a free copy of Mountain's peer-to-peer software.

If you're using Tecmar's QOTOS software, you can buy QOTOS/DS for \$349. Emerald's extra-cost EmQ software, for attaching the drive directly to a server, also allows peer-to-peer backups. Tallgrass sells OverNet (\$395), for use with NetWare 286 or 386. To use Palindrome's TNA for peer-to-peer backup, you must purchase Fresh Technology's Map Assist for \$349.

**BACKUP**

TNA performs two types of automatic backups: saves and checkpoints. If a file does not change during a specified period of time, TNA saves a permanent copy to three different tapes as they come into rotation. A checkpoint is a saved version of a file that TNA has not deemed stable enough to begin saving permanently.

If you want to use TNA manually, you can choose a variety of backup options without affecting the automatic tape rotation scheme. You can use the program's rule system to set parameters for volumes, directories, or individual files.

TNA will not back up shared open files. However, a list of missed files appears in an error report and in the database, so the next time you back up they are included. It can back up binderies and all forms of access rights except file-level trustee assignments.

**Score: Excellent**

You can have FileSecure do a file-by-file complete hard drive backup using "easy" or "total" backup options. The former automatically names the backup for you. You can back up only files that have been changed since the last backup, or select specific files and directories for backup using a tree display of your file system.

FileSecure comes with a software data compression option, which will leave you more tape space (but will slow down backups). **Score: Satisfactory**

QT provides a basic array of backup options. You can do complete and selective file-by-file backups, image backups, and a changed file backup. The Selective file-by-file backup lets you choose files and directories using a directory tree or wildcard specifications. QT is the only package that doesn't provide password protection.

Using the menus, you can build a batch file containing parameters for unattended or scheduled backups.

QT comes with optional software compression for an average 2-to-1 compression ratio. **Score: Satisfactory**

All of the units will back up your workstation's local hard disk as well as multiple file servers operating under both NetWare 386 and NetWare 286. They all can overwrite or append to tapes back up binderies, file attributes, and trustee assignments, use a variety of backup specifications, and perform scheduled and unattended backups. Maynard, Mountain, and Tecmar do image backups, a once hot feature that has fallen out of favor because it's difficult to predict how bad tracks will behave when they are restored to any disk but the original. All but Tecmar offer password protection.

Emerald, Tallgrass, and Tecmar offer the fewest extras, though the latter two are the only ones to provide data compression. The Maynard and Mountain drives both come with peer-to-peer backup software. TNA is tops.

**PERFORMANCE: RESTORE**

TNA lets you recover any increment of data, from a single file to multiple volumes. Due to the program's tape rotation method, more than one tape may be necessary to restore a volume (the vendor notes four to five tapes are necessary, on average). TNA will tell you which tapes to mount as they are needed.

When restoring individual files, TNA will show you all the different versions of the selected files that it has available. You simply choose a version and TNA will restore it. **Score: Excellent**

You can perform total or selective restorations. You can choose from several options, including whether the restored files will go to the same or different directory, and whether the program should overwrite files or restore system files. **Score: Satisfactory**

QT lets you do total or selective restorations. Selective restore lets you tag files for restoration in a manner similar to the way you choose files for backup, using a tree directory structure. You can restore files to either their original directories or different directories. You can also restore image backups file by file.

**Score: Satisfactory**

**RESTORE**

All the drives offer at least basic restore capabilities as well. All the units can restore to a different disk or directory. Of those that offer attribute backups, only Maynard does not allow a file-by-file restore. (Though file-by-file is much slower, it enables you to pick one file off the tape, instead of having to restore the entire image.)

Though you may have to pull data off more than one tape, Palindrome's restoration options are the best. Emerald's is next best, with EmLib helping you find the files you need. Maynard's librarian function is almost as good. Mountain, Tallgrass, and Tecmar offered the fewest features.

**PERFORMANCE: SPEED**

TNA was fast at all our benchmark tests except backing up modified files, at which only the DataVault was slower. This is probably due to the overhead of TNA's database. **Score: Good**

FileSecure wasn't the slowest drive, but it came close. It needed over half an hour to back up our hard disk and tended to be sluggish on the rest of the tests as well.

**Score: Satisfactory**

The DataVault was the slowest or one of the slowest drives in all our tests. It took 41 minutes to back up our entire hard disk and almost seven minutes to back up the modified files. **Score: Poor**

**SPEED**

RapidRecover was the overall fastest tape backup unit here. However, the reason for this may be its lack of a compare function, an integrity feature. Palindrome's TNA was next fastest, marred only by a slow backup of modified files.

Mountain's FileSafe turned in adequate times overall. The MaynStream zipped through backing up modified files, but was the slowest at restoring a 4½-megabyte directory because it doesn't take advantage of DAT's fast file searching capability.

Tallgrass' FileSecure was slow, but Tecmar's DataVault was the slowest.

**See Summary, page 133**

**See The Network Archivist, page 133**

**See FileSecure, page 133**

**See DataVault, page 133**

# dFacts Are In.

DATABASE COMPARISON TABLE	dBASE IV version 1.1	Paradox version 3.5	FoxPro version 1.02
<b>EASE OF USE</b>			
Control Center organizes data, queries, forms, reports, labels, applications on <u>one</u> screen	Yes	No	No
Create applications <i>without programming</i>	Yes	Yes	No
Modem pulldown menus for all Design Tools	Yes	No	Limited
Query by Example (QBE) for easy access to information	Yes	Yes	No
Context specific help by menu item	Yes	No	No
<b>PRODUCTIVITY</b>			
Quick Layout for automatic forms, reports and labels	Yes	No	Yes
Application Generator for quick application development	Yes	Yes	No
Automatic code generation for all Design Tools	Yes	No	No
Automatic maintenance of <u>multiple</u> indexes for ordering data	Yes	No	No
Memo fields for notes, letters, descriptions	Yes	No	Yes
<b>POWER &amp; FLEXIBILITY</b>			
Bold, underline, italic, subscript, superscript text for high impact reports and labels	Yes	No	No
User Defined Functions for extending programming language	Yes	No	Yes
Data input validity checking in forms	Yes	Yes	Yes
Multi-user transaction processing ensures data integrity	Yes	No	No
Number of file formats imported/exported	7	6	3
<b>INDUSTRY STANDARDS</b>			
#1 Selling, #1 Rated multiuser database; over 3 million users (1)(2)	Yes	No	No
Compatible with dBASE III PLUS data and applications	Yes	No	Yes
Compatible versions for DOS, VAX VMS, Macintosh, SunOS and other UNIX platforms (3)	Yes	No	Limited
Structured Query Language (SQL) integrated with programming language	Yes	No	No

(1) dBASE III PLUS and dBASE IV comprise approximately 55% of PC database systems sold (3 times nearest competitor) according to the most recent report by the market research firm Audit & Survey (Oct. 1990) (2) Software Digest cited dBASE IV #1 among multiuser databases, October 1990 (3) Versions of dBASE IV are shipping for DOS, VAX, and SunOS. Macintosh and other UNIX Platforms are announced.

Based on what our customers tell us, we made a list of some of the most important features to look for in data management software.

Then we compared the new dBASE IV\* version 1.1 with two other database products.

As you can see, dBASE IV offers exclusive advantages in

many categories.

For instance, only dBASE IV lets you access all its functions from a single screen. Called the Control Center, this screen lets you manage existing data, and create new tables, queries, reports, forms and labels totally without programming.

When all the facts are on the table, it's easy to see which database software is best.

Of course we aren't the only ones who have come to this particular conclusion.

Software Digest rates dBASE IV version 1.1 the #1 Multiuser Database (Vol. 7, No. 13, Oct. '90).

# dTruth Comes Out.

# Software Digest

# RATINGS REPORT

The Independent Comparative Ratings Report  
for Selecting IBM PC Business Software

Volume 2 Number 19

## MULTIUSER DATABASE PROGRAMS

Ratings Key: ■ 70-100 ■ 50-69 ■ under 50

Software Digest Rating	Overall Evaluation	Overall Power	Program Name	Version Released	Performance	Flexibility	Error Handling	Ease of Learning	Ease of Use	Memory Requirement	Price	Volume Purchase Agreement	Page
***	70	67	dBase IV	11	■	■	■	■	■	450KB	\$795	✓	28
**	6.8	51	Paradox	3.5	■	■	■	■	■	640KB	\$995	✓	32
**	6.8	71	FoxPro/LAN	102	■	■	■	■	■	512KB	\$1095	✓	30
**	6.4	51	DataEase	4.2	■	■	■	■	■	640KB	\$750	✓	26
*	5.8	3.8	R:Base	3.0	■	■	■	■	■	520KB	\$995	✓	34
*	5.7	6.0	Clarion Professional Developer	2.1	■	■	■	■	■	512KB	\$845	✓	24
*	5.7	6.6	Advanced Revelation	201	■	■	■	■	■	640KB	\$995	✓	22

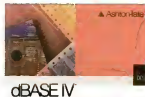
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Perhaps the most independent publication in the industry, *Software Digest* accepts no advertising whatsoever. Corporations pay hundreds of dollars a year to receive their monthly reviews—which are considered highly unbiased and objective. Their exhaustive, 75-page report concludes:

"Among the top ranking programs, dBASE IV (version 1.1) is the most well-rounded, with solid performance, versatility, and usability." Commenting on speed, *Software Digest* points out that "dBASE IV produces all three test reports as fast as or faster than FoxPro/LAN." As for Ease of Use and Ease of Learning, dBASE IV scored in the Excellent Range as many times as any other multiuser database product tested.

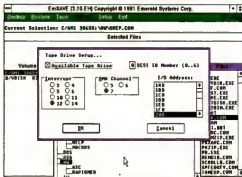
For a free evaluation kit, including competitive details and a free demo disk, call toll-free: 1-800-437-4329 ext. 1416. Better yet, call 1-800-2ASHTON to upgrade to the new dBASE IV now.

The truth is, no other database can do so much to improve productivity.



dBASE IV

**Ashton-Tate®**



The RapidRecover makes hardware setup easy by letting you choose options through the software.



The MaynStream DAT makes choosing files simply a matter of moving through a directory tree.



Mountain's FileSafe 1200 software offers a variety of backup options from one easy-to-use screen.

## How We Test

Continued From Page 128

general, this entailed selecting the total backup by name and restoring it, then selecting the incremental backup by name and letting it overwrite old files.

### DOCUMENTATION:

To rate satisfactory, documentation must provide basic instructions for hooking up the tape drive to your computer and using the software.

### SETUP:

Setup evaluates how easy it is for the first-time user to install the hardware and software. Setup of a 4mm DAT drive usually consists of simply plugging an adapter card into an open slot in your computer, using the supplied cable to connect the adapter and the tape unit, and supplying power to the tape unit.

### EASE OF USE:

This category evaluates how easy the average user would find the program to use once the basics have been mastered.

To earn a satisfactory score, a product had to offer a user-friendly menu with clear-cut options for the most frequently used backup and restoration operations.

### SERVICEABILITY:

Serviceability has three components: workmanship, support policies, and technical support.

**Workmanship:** Workmanship scores the quality of the design and construction of the systems tested.

**Support policies:** We require a one-year warranty and unlimited (but not toll-free) telephone support from the vendor for a score of satisfactory. We boost the grade for such extras as longer warranty periods and money-back guarantees.

**Technical support:** Technical support scores are based on the quality of service we receive during anonymous calls to the vendor.

### VALUE:

We consider list price in relation to a product's scores in all categories and its capacity and intended use. The better the performance/price mix, the better the product's value.

This product comparison was developed by Peter Schulz, Review Board; Brett Glass, Contributing Editor; Zoreh Banapur and Linda Slovick, Test Center Technicians; Gregory S. Smith, InfoWorld Test Development Specialist. We developed the benchmark tests for this product comparison.

### RapidRecover

(Continued)

### MaynStream DAT

(Continued)

### FileSafe 1200

(Continued)

## DOCUMENTATION

The documentation consists of an operations manual and a "quick" installation guide.

The *Operations Manual* is well written and designed. All the necessary details there, from software and hardware installation to program operation. On-line help is available throughout the software.

**Score: Satisfactory.**

Mountain comes with an installation and operations manual, a users' guide, a network users' handbook, and a quick-reference card. All the pieces are professionally done, with more than an adequate number of illustrations. Contents are laid out well, but we would have appreciated an index for the users' guide. The network users' guide contains an excellent description of network backup and restore operations.

**Score: Very Good.**

## SETUP

We could not get EmSafe and EmLib to operate reliably with real-mode Windows 3.0; however, considering the limitations of real mode, this isn't much of a loss. The software worked with the supplied run-time version of Windows 2.1.

We were surprised when EmSafe created a volume label on our local hard drive without asking for permission. This is apparently necessary so that EmSafe has a unique identification for the drive. The only switch-settable options are the adapter's I/O address.

The DMA (direct memory access) channel and IRQ number are set through the software, sparing you from having to set jumpers on the card.

**Score: Satisfactory.**

Setup of both MaynStream drives went without a hitch. Both seemed to back up data fine. However, upon verification of the data, one of the drives showed the files did not compare correctly. A replacement unit had the same problem. A technician sent by Maynard finally tweaked the drive into backing up correctly. However, we never found the exact cause.

Maynard's 16-bit SCSI adapter has only one two-position jumper for I/O address selection. This makes hardware setup very easy, but having only two selections for I/O address could cause address conflicts. Interrupt level and DMA are set via software.

**Score: Satisfactory.**

Hardware and software setup are simple. The package's automatic installation program suffers from a minor inflexibility—requiring you to install the software into a root directory named MTN.TAPE.

**Score: Good.**

## EASE OF USE

The RapidRecover software comes in only one flavor: Windows. It's a slightly presumptuous marketing decision, considering not everyone is familiar with Windows or wants to use it. Worse, it's limited to working with Windows 286 or Windows 3.0 in real mode (the next version will support standard and enhanced modes, according to the vendor).

Nevertheless, if you're familiar with Windows and how to use a mouse, EmSafe and EmLib are easy to use. The software tells you if you'll need another tape for a backup. A progress report during backup notes the elapsed time, number of files left to back up, and other operational pulse points. The program provides simple report information, including errors. **Score: Satisfactory.**

Some advanced options are available only from the command line, which is not ideal, but you get a lot more functionality if you take the time to learn them. (For instance, you can preset preferences to head off errors or accommodate changing file sizes.)

The program automatically retries open files at the end of a backup, and, if files are still open, it automatically creates a batch file you can use later to back up the stragglers.

The program's built-in tape Librarian lets you store all your directories in compressed form on your hard disk and use this as an index to find which tape a file is on. Four levels of reporting are provided, offering combinations of volume, errors, directories, files, and attributes.

**Score: Good.**

FileSafe keeps you posted during backups both on-screen and on the hardware. The software provides a progress report listing elapsed time, number of files left to back up, and percentage completed. It also tells you how much space is left on tape before you back up to it. In addition, a small, eight-character backlit LCD panel on the outside of the box continuously displays status information, telling you whether the drive is reading, writing, rewinding, or searching.

FileSafe provides simple report generation, with no particular grouping capabilities. Skipped files go into a separate ASCII file, which you can back up later using Auturion, the unattended backup software.

FileSafe offers no multitapecataloging of file information, although it can display the directory information of all volumes (backup sets) on a given tape.

**Score: Good.**

See RapidRecover, Page 136

See MaynStream DAT, Page 136

See FileSafe 1200, Page 136





The Network Archivist keeps you up to date on tapes' contents and what your next backup operation will be.



As do the others, FileSecure lets you choose files for restoring much the same way you do for backups.



Tecmar's QT software is basic but slick, with an Xtree-like file information display on the right.

#### Network Archivist (Continued)

#### FileSecure 1300 (Continued)

#### DataVault (Continued)

#### Summary (Continued)

### DOCUMENTATION

Though it lacks illustrations, a hardware installation manual is adequate. The *Administrators' and Reference Guide* goes into more — but not enough — depth about TNA. Such a complicated product deserves more coverage.

**Score: Satisfactory.**

The small *Guide to Operations* describes the hardware installation and provides diagrams to get over the rough spots. The FileSecure users' guide does the adequate job of describing software installation and use and provides helpful screen shots.

The on-line context-sensitive help works well. Overall, however, the Tallgrass documentation is rather amateurish in appearance and writing style.

**Score: Satisfactory.**

We liked the QT software manual, a perfect-bound book that covers everything you need to know about the software. QT also supplies on-line help accessible with the F10 (instead of F1) key. The program also comes with a separate hardware manual.

**Score: Good.**

All the documentation was at least satisfactory. Each software package came with context-sensitive help. Mountain offered the best overall manuals with clear explanations and plenty of illustrations. Tecmar's and Emerald's documentation was also a cut above average.

Tallgrass' documentation is the skimpiest. Palindrome provides better than average installation instructions, but it needs to beef up its explanations of TNA's concept.

### SETUP

After repeated "marginal tape drive" error messages, we had to reorder one of our TNA units. Though this unit gave us the same error, it eventually operated correctly. The vendor could not pinpoint the problem.

Installation of our other TNA drive proceeded normally. TNA's automatic software installation program will also install the program's expansion disks.

Palindrome requires precise search and drive mappings because the databases that track tapes reside on different volumes. **Score: Satisfactory.**

Hardware installation is simple as long as you use all the default jumper options. If you have to change the defaults, you'll have to decipher the cryptic jumper block descriptions in the manual and on the SCSI card. **Score: Satisfactory.**

Tecmar's adapter card sports a multitude of jumpers, which you probably will not have to change unless there is an address conflict. If you do need to change one, the hardware manual supplies more than enough detail to make the job easy.

There is no automatic installation program for the software, but you hardly need one; the entire program consists of three files. **Score: Satisfactory.**

### SETUP

Of the 12 drives we ordered (two of each), we had intermittent installation or usability problems with two. We had to reorder one set of the Maynard and Palindrome drives. The replacement Palindrome unit eventually worked, though we could never locate the source of the problem. A technician sent by the vendor eventually coaxed the Maynard into backing up files correctly, but could not explain the problem to our satisfaction.

None of the units is difficult to install or set up. All but Tecmar's QT come with automatic software installation programs. We had the fewest problems with Mountain's FileSafe.

### EASE OF USE

TNA's automatic mode is simple to operate. You specify the backup operation to begin. TNA tells you which tape to insert, and it performs the operation.

Restoration is more complicated because multiple tapes may be involved. A large restore could take quite a long time. However, TNA holds your hand all the way.

TNA can tell you how much space a tape has before you back up to it, offers an on-screen "progress report" during backup, and provides a variety of reports based on tape journal, server or volume, directory, and user. It will not back up any open files. **Score: Very Good.**

FileSecure's menu-driven operation is easy to follow. You can back up shared open files but not files that have grown since the backup began (they will no longer fit in the place on the tape saved for them); these will be issued to an error log.

The program provides simple reporting: You can manipulate the log file to save every file or only record configuration and status information (such as errors).

A "gas gauge" counts files and bytes as you back up. The program can tell you whether you'll need another tape for the proposed backup, but it cannot tell you how much space is left on the tape. FileSecure can display the directory from a given backup set, but it's up to you to know which tape it resides on.

**Score: Good.**

The menu-driven QT software makes good use of function keys. The documentation and on-line help keep you well apprised.

You can choose to have QT skip an open file or wait for it to close. It will back up shared open files. Backup proceeds with a handy progress report of how many files are left to back up, percentage completed, etc.

From QT's menu, you can search for files on one volume using wild cards or date or time parameters. You can search across multiple volumes on one tape from QT's command line. **Score: Satisfactory.**

All the drives offer identical or similar tree directories for both backing up and restoring files. All make things easier with scripts or batch files and context-sensitive on-line help.

We thought The Network Archivist was the easiest to use because of its step-by-step guidance. The FileSafe and the FileSecure offer similar progress and reporting capabilities. The MayStream has a slight edge with its tape librarian and smooth handling of open files.

The DataVault workstation-based software is lean on features, so there's less to streamline your backup work. The RapidRecover will only appear to Windows users who don't mind operating in real mode.

### EASE OF USE

# Northgate® SlimLite™



- Six Pounds Of SX20 Power!
- Brightest, Sharpest Screen You've Ever Seen In A Notebook!
- PLUS A Keyboard You'll Think Is Right Off Your Desktop!

**A** Great Notebook *MUST* (1) Be Lightweight and Small; (2) Have a Super Readable Display; (3) And Have a Desktop Quality Keyboard!

Northgate got all three just right... as well as a whole lot more you'll learn about in this ad.

But, for ALL the facts, we'll send you the actual User's Guide that comes with the computer. Free! Simply phone one of our sales reps. That's free too!

*Then you'll know exactly what you're getting when you phone to place your order.*



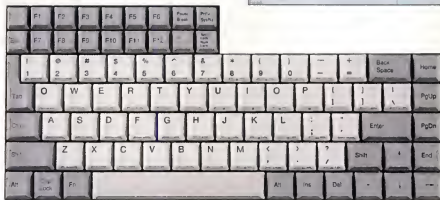
**FAST FACTS:** SlimLite is made for easy toting. A nifty 11.7" x 8.25" x 1.9", it tucks easily in your briefcase. Plenty of room for extra batteries, AC adapter, mouse PLUS your business essentials.

SlimLite won't bog you down either. Just 6.1 lbs. including battery. AC adapter weighs half that of others. Lots smaller, too.

Turn on SlimLite and settle back for the most enjoyable portable computer experience of a lifetime.

## RAZOR SHARP READABILITY:

Sparkling bright sidelit LCD display with plenty of contrast. Experts say it's the very best they've ever seen. Supports a true 32 shades of gray (Windows Solitaire addicts, you'll actually see differences between black and red suits). Other systems claim 32 shades but just don't seem to measure up to SlimLite. Compare before you buy!



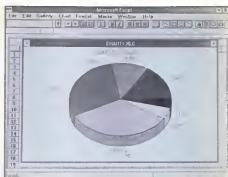
**KEYBOARD CAUTION:** Before you buy a notebook check out the keyboard. Beware those that have lots of FN key functions. Many systems require using these in conjunction with other keys. They substitute for separate keys.

*Excessive FN key use slows down your typing, can be confusing and downright aggravating.*



TOP: Rechargeable Ni-Cad battery weighs 1.05 lbs.  
BOTTOM: "AC Pack," tiny and weighs well under a pound.

**RIGHTSIDE UTILITIES:** The 1.44Mb 3.5" floppy drive is positioned where it should be — up front — for easy use. To charge battery or to use AC power, plug the adapter into the jack provided. It's in back to keep cords out of your way.



SlimLite has separate PG UP, PG DN, HOME and END keys... And independent inverted "T" cursor keys. You'll feel like you're typing on your office desktop.

The typing keycaps are full size and comfortable. Keyboard quality you expect only of Northgate.

**POWER EXTENDER:** You'll get an amazing two and a half hours of continuous real time work with SlimLite. Ingenious power-down feature saves energy, lets you resume working where you stopped. The rechargeable battery is a wondrous power module, one of the smallest, lightest ever made. Two of them will get you through a coast-to-coast flight. SlimLite recharges when in use with AC adapter. External battery charger available.



**LEFTHAND CONNECTORS:** Behind a hinged side panel, SlimLite has ports for external VGA monitor and keyboard plus a 9-pin serial port, parallel port and phone jack plug.

## SLIMLITE DOUBLES AS A DESKTOP!

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### Northgate SlimLite Features:

- System dimensions: 11.7" x 8.25" x 1.9"; battery: 4.87" x 2.73" x 0.68"; AC adapter: 5.32" x 2.71" x 1.75"
- System weight 6.1 lbs with battery; AC adapter 0.8 lb.; battery 1.05 lbs.
- 84-key keyboard emulating 101
- 9" diagonal LCD screen; supports 32 shades of gray; VGA 640 x 480
- 386SX/20MHz processor
- 80387SX coprocessor support
- 3MB RAM; expands to 5MB
- 20MB hard drive with auto parking; 40MB and 60MB drive options available
- 1.44MB 3.5" floppy drive
- LED indicators for power on/battery low, charging, caps lock, num lock and hard drive access
- External VGA monitor and keyboard ports
- 9-Pin serial port; parallel port
- Supports internal 2400 baud modem (optional)
- One-year parts/labor warranty
- Toll-free technical support — 24 hours a day

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7075 Flying Cloud Drive, Eden Prairie, MN 55344



There is no internal version of Emerald's RapidRecover.



The MaynStream unit can use the new 90-meter tape.



The FileSafe's LED keeps you informed.

## 4mm DAT May Have The Competitive Edge On Big Brother 8mm

Pioneered by Exabyte before DAT existed, 8mm drives use ordinary camcorder cartridges, together with a specially modified Sony tape transport.

One 8mm tape holds up to five gigabytes (almost double that if you use data compression), and they can be swapped by a mechanical "jukebox" to provide tremendous amounts of storage.

Both DAT and 8mm use helical scan technology, which moves heads at an angle across the moving tape, resulting in extremely high recording density.

Both offer low media costs but expensive hardware, and both suffer from slow data transfer rates. However, DAT proponents claim that the 4mm format is technologically superior to the 8mm in several ways.

First, 4mm DAT was designed from the outset to hold digital data; hence it doesn't require a specially modified analog recorder. Also, 4mm DAT drives have about half as many moving parts as 8mm decks, potentially increasing the mean time between failures. (Backers of QIC, which uses even fewer moving parts, use the same argument against DAT.)

Four millimeter drives may cause less tape wear per pass. The reason for this is that the *wrap angle* — the number of degrees the tape wraps around the spinning head assembly — is smaller on a 4mm system: 90 degrees vs. 8mm's 221 degrees. Less contact with the heads, and fewer rollers and guide rails to position the tape, means less friction and longer tape life.

The error correction on 4mm DAT is better: three levels compared to the two found on 8mm. Searching for a file is generally faster on 4mm drives than on 8mm.

8mm drives will always be limited to a 5¼-inch form factor because of the size of the bulky 8mm video cartridge. Many 4mm (and QIC) drives, on the other hand, are already appearing in half-height and 3½-inch footprints.

Design concerns aside, many dislike the fact that Exabyte has a lock on the 8mm market. Thanks to an agreement with Sony, manufacturer of the 8mm camcorder drive, Exabyte is the only company allowed to resell the specially modified drive. And only Exabyte makes the set of integrated circuits to control the drive and read and write the data.

Like QIC drives, 8mm drives currently enjoy a larger installed base than 4mm drives, a relative newcomer. However, 4mm tape drives are expected to lead the market eventually, perhaps within a year or two.

— Brett Glass

### RapidRecover (Continued)

All components on Emerald's half-length SCSI adapter card are surface mounted. The drive comes with both an internal 50-pin SCSI connector and an external connector. Although we saw three corrective wiring changes on the card (to enable it to run with a particular IBM compatible, according to the vendor), the adapter, cabling, and external tape unit all exhibited normal care and workmanship. **Score: Satisfactory.**

### MaynStream DAT (Continued)

We found Maynard's half-length 16-bit SCSI adapter to be of good quality design and construction, with no visible patches. The Archive tape unit and enclosure were also well-designed and constructed. **Score: Good.**

### FileSafe 1200 (Continued)

Mountain's SCSI adapter appears well laid out and manufactured. The board contains no after-assembly fixes, and jumpers are clearly marked. The tape drive enclosure is quite attractive. **Score: Good.**

## WORKMANSHIP

The vendor offers a one-year hardware warranty and unlimited free support on a toll-free telephone line. You can also send in questions over the company's fax machine and private electronic bulletin board. **Score: Very Good.**

The vendor provides unlimited free support over a toll-free line, fax, and a private BBS. There is a five-year warranty for adapter cards and a one-year warranty on the drive. If your drive needs repair during the first six months, Maynard will ship you a replacement free of charge while you wait. Lines are open from 8:30 a.m. to 8 p.m., Eastern time, every weekday. **Score: Excellent.**

Mountain provides unlimited free support over a toll-free line, fax, and a private BBS. For weekends and after hours, "Robotech," a round-the-clock phone service, will take error codes and offer a description and fix. There are free software updates and a one-year hardware warranty, with free replacement the first six months. There's also a 60-day money-back guarantee. **Score: Excellent.**

## TECHNICAL SUPPORT

We had to hold for 9 minutes on one occasion and received a call back from a technician within 15 minutes on another. Technicians were friendly and helpful. **Score: Satisfactory.**

We had to wait on hold twice for 8 minutes; on another occasion, a technician returned our call a little over 3 hours later. Support personnel did fine with run-of-the-mill questions. Our file compare problem stumped them, and they suggested we send the unit back for a replacement. **Score: Satisfactory.**

We had to wait on hold fewer than 5 minutes each time we called. Support personnel were very friendly and helpful. **Score: Very Good.**

## VALUE

For a 4mm DAT drive, the RapidRecover lists for a middle-of-the-road price of \$5,995. It has everything you need and some extras, such as its tape librarian. It's fast because it neglects some data checking, so you may be trading speed for peace of mind. Windows lovers will appreciate the interface, but it's not yet functional under Windows 3.0. **Score: Satisfactory.**

At \$5,995, the MaynStream DAT drive is a solid backup device with a respectable number of backup and restore options. Its tape-librarian feature is particularly useful. **Score: Good.**

The Mountain FileSafe is priced identically to the RapidRecover and MaynStream (\$5,995). It lacks a few features (such as disk grooming and disk cataloging), yet has a few extras of its own, such as FileTalk, for backing up peer hard drives. **Score: Good.**

## Product Summaries

### RapidRecover Version 3.1

Company: Emerald Systems, 12230 World Trade Drive, San Diego, CA 92128; (619) 673-2161.

List Price: \$5,995, external subsystem including cable; half-length 16-bit proprietary SCSI adapter; EmSave and EmLib software; run time of Windows 2.1; one 1.3-gigabyte DAT cartridge.

Requires: PC AT or compatible; DOS 3.0 or later; 512K of RAM; hard disk; free expansion slot; Novell NetWare 286 or

386, LAN Manager networks.

### MaynStream DAT Version 3.0

Company: Maynard Electronics, 36 Skyline Drive, Lake Mary, FL 32746; (407) 263-3500.

List Price: \$5,995, external subsystem including cable; half-length 16-bit proprietary SCSI adapter; MaynStream, Ise-LAN and MaynLAN software; one 1.3-gigabyte DAT cartridge. Requires: PC AT or compatible; DOS 2.1

or later; 512K of RAM; hard disk; free expansion slot; Novell NetWare 286 or 386, any NetBIOS-compatible network.

### FileSafe 1200 Version 5.1.2

Company: Mountain Network Solutions, Inc., 240 East Hacienda Ave., Campbell, CA 95008-6623; (408) 379-4300, (800) 458-0300.

List Price: \$5,995, external subsystem including cable; 16-bit proprietary SCSI adapter; FileSecure software; coupon for





Palindrome packages TNA with ArDat hardware.



Internal and external FileSecures are priced identically.



The DataVault exhibited the best workmanship.

### Network Archivist (Continued)

### FileSecure 1300 (Continued)

### DataVault (Continued)

## WORKMANSHIP

## WORKMANSHIP

The SCSI adapter contains only one chip and a few miscellaneous components and jumpers. We noted no wiring changes. All the other hardware components—enclosure, drive, cabling—exhibited solid manufacturing techniques.

**Score: Good.**

Tallgrass' adapter contains a fair number of discrete logic chips, as well as a SCSI protocol chip. We noticed two patches. The card contains numerous jumper blocks for setting I/O addresses, IRQ, DMA, and other hardware options. IRQ and DMA jumpers are grouped together in a confusing array that even a printed diagram doesn't make clear.

The other components show standard workmanship. **Score: Satisfactory.**

All the components indicated better-than-average construction and design. The SCSI adapter uses mostly surface-mount technology in its construction and showed no patches. **Score: Very Good.**

All the drives exhibited at least satisfactory workmanship. The Maystream, FileSafe, and Palindrome drives all were solid pieces of work with no patches on the adapter cards. The DataVault looked the best.

## SUPPORT POLICIES

## SUPPORT POLICIES

Palindrome offers free, unlimited telephone support on a toll line, a one-year hardware warranty, and a 90-day money-back guarantee. In addition, the company provides free unlimited on-site support and support over fax and a BBS.

**Score: Excellent.**

The vendor offers unlimited free support over a non-toll-free line and fax and a two-year hardware warranty.

**Score: Good.**

Tecmar offers a two-year hardware warranty and free, unlimited support over a toll-free line, BBS, and fax. You can reach support personnel from 7 a.m. to 7 p.m. Eastern time. **Score: Excellent.**

Maynard, Mountain, Palindrome, and Tecmar all score an excellent for their generous support policies. Emerald offers the next-best support, then Tallgrass. At last but Palindrome and Tallgrass have toll-free lines, and most offer several extras, such as money-back guarantees. Mountain's Robotech, a round-the-clock automated system, listens to your error message blues and offers solutions.

## TECHNICAL SUPPORT

## TECHNICAL SUPPORT

We got through to friendly, helpful support personnel each time we called. In one case, the technician called back after verifying information with a Palindrome engineer. **Score: Very Good.**

We had to wait on hold briefly each time we called. Each time we spoke with a friendly technician who knew the product well and tried to go the extra mile.

**Score: Very Good.**

Each time we called we got through to a technician in fewer than three minutes. Personnel exhibited a supportive, caring attitude toward customers.

**Score: Very Good.**

Most of the vendors provided better-than-average technical support. In most cases, we got through to knowledgeable technicians without undue delay. Mountain, Palindrome, Tallgrass, and Tecmar were particularly accommodating. Maynard took the longest to return a call.

## VALUE

## VALUE

For \$6,985, you get The Network Archivist on a 4mm DAT drive with support for unlimited storage capacity. The least expensive configuration of TNA on a DAT machine is \$4,995, but this gives only 350 megabytes of storage. Configured for 1 gigabyte of storage, a package costs \$5,990. TNA is \$1,000 more than the others; however, it has the most to offer in storage management and ease of use. **Score: Very Good.**

For the bargain price of \$4,595, the Tallgrass FileSecure is a rather slow, meat-and-potatoes 4mm DAT drive that does an adequate job without a lot of frills. **Score: Good.**

The DataVault lists for \$4,995. The QT software and ISA adapter are packaged together, for a list price of \$495 (a MicroChannel version costs \$695). Altogether, a workstation-based package costs a reasonable \$5,490.

QT is one of the simplest software packages here, and the DataVault is the slowest drive, but together they perform their functions reliably.

**Score: Satisfactory.**

Although it's the most expensive package here, Palindrome's extensive data management capabilities and speed make it the top value. The FileSecure (the least expensive), Maystream, and FileSafe all add up to good values. Emerald's Rapid-Recover and Tecmar's DataVault are satisfactory values.

FileTalk software; one 1.3-gigabyte DAT cartridge; cleaning cassette.

**Requires:** PC AT or compatible, running DOS 3.1 or later, or OS/2 1.2 or later; 512K of RAM; hard disk; free expansion slot; Novell NetWare 286 or 386, Microsoft LAN Manager 1.2, IBM LAN Server 1.2, IBM PC LAN.

**The Network Archivist  
Version 1.8c**

Company: Palindrome Corp., 850 East Diehl Road, Naperville, IL 60563; (708) 505-3300.

**List Price:** \$6,985, external subsystem including 8-bit Future Domain SCSI adapter; cable; The Network Archivist software; one 1.3-gigabyte DAT cartridge; one cleaning cartridge; two expansion disks for unlimited capacity; \$5,990, includes one expansion disk for 1-gigabyte capacity; \$4,995, no expansion disks; 350-megabyte capacity.

**Requires:** PC XT or compatible running DOS 2.0 or later; 640K of RAM; hard disk; free expansion slot; Novell NetWare 286 or 386.

**FileSecure 1300  
Version 1.44**

Company: Tallgrass Technologies Corp., 11100 West 82nd St., Lenexa, KS 66214; (913) 492-6002, (800) 736-6002.

**List Price:** \$4,595, external subsystem, including cable; 8-bit proprietary SCSI adapter; FileSecure software; one 1.3-gigabyte DAT cartridge.

**Requires:** PC XT or compatible running DOS 2.0 or later; 384K of RAM; hard disk; free expansion slot; Novell NetWare 286 or 386, PC LAN, LANtastic.

**DataVault  
Version 1.2**

Company: Tecmar, 6225 Cochran Road, Solon, OH 44139-3377; (216) 349-1009, (800) 624-8560 (outside Ohio).

**List Price:** \$4,995, external subsystem including cable and one 1.3-gigabyte DAT cartridge; \$495, 16-bit Adaptec SCSI adapter and QTOS software.

**Requires:** PC AT or compatible running DOS 3.0 or later; 640K of RAM; hard disk; free expansion slot; Novell NetWare 286 or 386, IBM PC LAN, Tops, DCA 10Net.

## The Great Debate: Server-Based vs. Workstation Backups

**T**o back up a network file server, a tape drive unit is connected either directly to the server or to a workstation on the network. The superior method is largely a matter of opinion. Several of the vendors in this comparison either currently provide server-based backup software or will soon. Some, such as Mountain Network Solutions, don't offer or recommend it.

Server-based backups bestow the advantages of speed and device sharing. Hooked directly to the server, a tape drive has a much better chance of performing optimally (in DAT's case, more than 10 megabytes a minute). This is not only because the backup bypasses network traffic, but because the server is usually a much more powerful machine than a network workstation. Even an overnight backup may not finish before morning if you're trying to transfer multiple gigabytes using a drive connected to a workstation.

With the tape drive attached to the server, users can do their own backups and restores, rather than rely on an administrator. Of course, with this approach goes the responsibility of setting up individual security parameters.

Security of the tape drive itself is another consideration. In most installations it's the file server that gets placed in areas accessible only by authorized personnel. Unless you provide the same security precautions for a workstation-based tape drive, midnight backups won't be as tamper proof.

The biggest case against server-based backup seems to be crashes, which would render the tape drive useless until the server recovers. Another concern is that backup software applications placed on the server must compete for resources, which could cause some performance degradation.

In this group, three of the vendors sell server-based software for NetWare.

Tecmar sells its own version of Cheyenne's ArcServe software, and by the time you read this, Taligraas should be shipping its version of ArcServe, called NetSecure. Emerald sells its own package, called EmQ.

Though neither of the vendors recommends using its drives this way, you can attach the Mountain or Maynard drives to a server using Cheyenne's ArcServe and cables and controller cards from the vendors.

Maynard will soon ship a product called LANStream, which has a client/server architecture, according to the company.

Another alternative is a dedicated tape server. Though you must tie up an extra machine, you don't affect server performance as much, and either users or the administrator can initiate backups.

Maynard will soon release a package for a dedicated backup server, according to the company.

— Peter Schultz

## Data/DAT Format Offers Interesting Alternative to DDS

**D**AT backup units may use one of two standard formats: DDS or Data/DAT. Hewlett-Packard Co. and Sony pioneered DDS, the currently dominant standard. Rivals JVC and Hitachi designed Data/DAT.

The two standards are alike in many ways. They use the same media and transport mechanisms, and their read and write speeds — as well as their tape capacities — are nearly identical when they record sequentially (the traditional

mode of operation for backup tape drives).

But Data/DAT was developed by companies that were loath to pay royalties to their competitors (hence it is free for all to use), and it adds features beyond those of DDS. Besides providing sequential access, a Data/DAT tape also can be preformatted, like a disk, and used as a large and relatively inexpensive (though slow) random-access device. This allows it to be used for applications that DDS

can't handle.

Data/DAT also has a few other enhancements, such as built-in password protection, faster searches, and slightly better error correction. Because DAT drives are used primarily for streaming tape backup, users haven't demanded the added features of Data/DAT. It is a competitive format, however, and it may grow in popularity as new applications are devised for digital tape.

— Brett Glass

### BENCHMARKS

**INFO  
WORLD**

#### 4mm DAT Drives

Test times in minutes:seconds. Lower times indicate better performance.

##### Server Backup\*

Emerald Systems RapidRecover

19:09

Maynard MaynStream DAT

23:29

Mountain FileSafe 1200

25:45

Pallindrome The Network Architect

16:06

Taligraas FileSecure 1300

35:21

Tecmar DataVault

41:08

\*73 megabytes.

##### Directory Restore\*

Emerald Systems RapidRecover

2:02

Maynard MaynStream DAT

14:18

Mountain FileSafe 1200

3:06

Pallindrome The Network Architect

2:30

Taligraas FileSecure 1300

5:02

Tecmar DataVault

2:58

\*4.5 megabytes.

##### Modified Files Backup\*

Emerald Systems RapidRecover

1:19

Maynard MaynStream DAT

1:02

Mountain FileSafe 1200

2:17

Pallindrome The Network Architect

4:50

Taligraas FileSecure 1300

4:28

Tecmar DataVault

6:58

\*410 kilobytes.

##### Directory Restore\*

Emerald Systems RapidRecover

2:33

Maynard MaynStream DAT

15:30

Mountain FileSafe 1200

4:05

Pallindrome The Network Architect

2:10

Taligraas FileSecure 1300

4:40

Tecmar DataVault

5:50

\*4.5 megabytes including some modified files.

Server: 20MHz Compaq 386/20n with 100-megabyte hard disk and 4 megabytes of RAM. Network Operating System: Netware 2.2. Workstation: 20MHz Compaq 386/20n running Compaq DOS 3.31 and equipped with a 4-megabyte hard disk and 4 megabytes of RAM. All units but Emerald tested with a "compression" feature turned on (the double-checking backed-up data against original data). Verify (for checking media) was not turned on.

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800 x 600 x 32,768 colors	yes	—
1024 x 768 x 256 colors	yes	yes
TrueView™ Utility†	yes	—
Windows® 3.0 driver	yes	yes
8514-A driver	yes	yes
Selectable monitor type‡	yes	yes
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‡VGA700 also available with 512K and 256K memory configurations.



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# IMPRESSIONS

**FIRST LOOK** ■ BY MICHAEL J. MILLER

## PC Tools Deluxe, Release 7 Does Windows And Networks



Central Point Software's PC Tools has always offered a phenomenal number of utilities for the money, and Release 7 is no exception.

This latest version adds several major utilities, including a Windows-based backup program, and a remote communications program, plus enhancements to most of the basic utilities included with previous versions. As before, the package has many utilities, ranging from PC Shell to Central Point Backup to various data recovery and protection utilities, to several desktop manager utilities that can be loaded as RAM-resident utilities (including a notepad, outline, appointment scheduler, communications program, and nice flat-file database).

The biggest change to all of the DOS-based utilities is that the user interface has been dramatically updated, so it is now much more graphical, and has pull-down menus that resemble those in Windows, or the forthcoming DOS 5. This is most visible in PC Shell, which remains a nice DOS shell and now offers you the choice of new menus or old.

The new design is also evident in Central Point Backup, perhaps the most important of the utilities. Backup has been enhanced to support tape backup systems, making it easier to back up large drives and now also works better with networks.

The most important new utility is Commute, which lets you take control of a remote computer and run it from another machine over modem or LAN lines. It's a nice remote communications package with some fine extras, such as new drivers that let the program work with Windows.

Several of the smaller features have also been enhanced in this version. From PC Shell, you can now access a much better menu system, which gives you access to all the various PC Tools utilities and other DOS programs. From the main menu, you can also call a number of smaller utilities, most of which you can now run as stand-alone utilities, in addition to running them from PC Shell. A useful File Find can locate files across directories and now includes viewers for a whopping 35 different file formats. The Directory Maintenance utility works nicely across Novell networks and features a very nice "prune and graft" feature that lets you reorganize your hard disk. And System Information gives you lots of detail about the configuration of your system, including information on software and hardware interrupts, and programs loaded in memory.

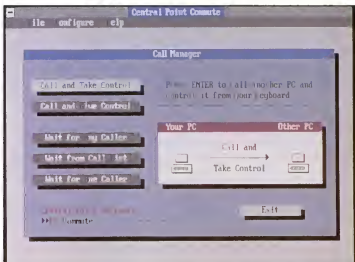
A major addition is a set of new Windows-specific utilities. Of these, the important one is a Windows-based version of the Central Point Backup program, the first Windows-specific backup program I've seen, although I expect that Fifth Generation's Fastback and Symantec's Norton Backup will be unveiled shortly. Like the character-based version, Backup for Windows now supports tape drives and removable disks, can verify disks, and lets you select which files to back up. The Windows version of Central Point's backup program has a very nice graphical interface and works almost exactly like the character-based version. The program also includes a Windows-based version of the undelete utility (although you still need to use the character-based version for manual undeletes), and a utility that lets you launch programs directly from within other

Windows programs.

All in all, this is an amazing set of utilities — ranging from the merely competent, such as most of the Desktop Manager utilities, to the very good, such as the two Backup programs.

PC Tools is so diverse a collection of utilities that I can't imagine that anyone

would run all of the various tools. Still, the new version's a bargain for just about anyone at \$179 (upgrades are \$49 for other versions; \$59 from competitive products through August 31). Central Point Software, 15220 N.W. Greenbrier Parkway, #200, Beaverton, OR 97006; (800) 445-4208.



PC Tools 7 features Commute, which lets you control a remote computer and run it from another machine over modem or LAN lines.

### FONT CARTRIDGE

## Type City Font Cartridge Enlivens Font Capabilities With Sparkling Customization

If you have decided to hold off on that printer upgrade — to PC-L5, PostScript, or True Image — or want a fix to the font doldrums of your LaserJet II, I have a suggestion. Type City from Bitstream is a font cartridge that is likely to suit your needs.

Like most cartridges, Type City starts essentially as a box of fonts. In the cartridge itself, there are three typefaces in numerous sizes, with many styles applied. Don't worry if this sounds like other typical cartridges — it is. But Type City will let you expand as your needs increase.

Unlike most other cartridges, Type City has four font card slots that allow you to expand on and customize your font library. On the sides of the cartridge are two slots each. The cards that fit are capable of holding approximately 250K of information.

Currently, Type City ships with one of these cards, bringing the number of typefaces up from three to six. There are three other font cards available for \$99 each, with five more to become available soon.

What I like best about the Type City font card concept is that you can have these cards customized so that specific cards hold particular fonts and Bitstream will rasterize images onto a card, includ-

ing such things as your company logo or other images under 250K (price depending on the work involved). You need to update drives as you customize, which is done through a simple install routine.

My experience with Type City was positive. I had the cartridge installed in our networked Hewlett-Packard LaserJet II. I used Type City with the Skyrunner card (headline style fonts) installed.

Installing Type City and the additional cards is a no-brainer. Print speed seems as quick as with the LaserJet without the cartridge installed and much quicker than the QMS 810 PostScript printer that is also installed on the network (the reason here is that the fonts in Type City are bit-mapped fonts vs. scalable typefaces for the QMS).

My only gripe is that screen fonts with Windows 3.0 could be better.

If you are waiting on making your next printer upgrade or looking to give a more professional look to your documents, Type City is an outstanding choice. The product lists for \$379.

Bitstream, 215 First St., Cambridge, MA 02142; (617) 497-6222.

— Jeff Eckert

Impressions are brief looks by InfoWorld staff and reviews at newly announced and released products.

### THERMAL COLOR PRINTER

## NEC's Colormate PS Model 40 Thermal Printer Stands Out in the Color PostScript Market

NEC has made a major move in the color PostScript market with the release of the Colormate PS Model 40. This color thermal printer is priced at \$6,995, making it an attractive choice for presentation graphics as well as a good choice for color proofing.

I was impressed with the PS Model 40's output quality. Colors are distinct with no apparent bleeding or running. The printer is also Pantone licensed. Standard configuration for the PS Model 40 consists of 4 megabytes of RAM and 17 Adobe typefaces. There is an update kit (\$2,000, available for increasing the RAM to 8 megabytes and to bring in an additional 18 Adobe typefaces).

Although \$6,995 may be out of reach for many, the Model PS 40 is a worthy alternative for producing your own presentations, or for color proofing.

NEC Technologies Inc., 1414 Massachusetts Ave., Boston, MA 02119; (508) 264-8000.

— Jeff Eckert



The Colormate PS Model 40 features RAM expandability to 8 megabytes; 18 Adobe typefaces can be brought in.

## REPORT WRITER

Modify  
Select item to modify. Press Esc when done

Line: 6 Col: 9 - MENU

.....2.....3.....4.....5.....6.....7.....

Title	
Title	
Title	
Header	
Body	Cust: COMPANY
Body	XXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Body	
Body	XXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXX
Body	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Body	
Body	Field: = Text =
Body	Type: Text
Summary	
Summary	Text: COMPANY
Summary	Format: Left
Summary	Attribute: Bold
Summary	Font: S Helvetica, 11.0 Points
Summary	Auto-Trim: Yes
Field	FIELD MODIFY

To examine format assignments in R&R Report Writer, just point to the field and press F4 to enter modification mode.

## R&R Report Writer Update Enables Users to Format Templates and Create Calculated Fields

**C**oncentric Data Systems invented state-of-the-art X-Base (dBase and its compatibles) report creation. Now it has gone one step better with the latest version of R&R Report Writer.

A band-oriented report writer, R&R lets you format fields with familiar X-Base formatting templates and create calculated fields and conditional fields. You can easily draw boxes and lines. Version 4.0 of R&R fulfills just about every item on a user's wish list. New widow and orphan control lets you better manage page breaks. New proportional font size is a joy to work with. All you do is load the R&R font information files that correspond to the printer and fonts you are using. It sure beats having to manually embed an endless number of huge, ugly laser printer control codes or fatter laser printer functions in a report and debug them.

A new WYSIWYG preview option, including a zoom-in facility, lets you see a report before you print it. New modifiable "quick" report layouts also help novices.

R&R now lets you do preprocessed totals, which means you can scan a database multiple times and create total calculations and percents of totals. You can also now sort and query totals.

X-Base developers have long appreciated the ability to include R&R reports in applications using the included, unlimited run-time module. Rising to the requests of many developers, R&R now lets you replace the old concentric run-time message that a report is being processed with a more useful report status message. R&R is easy enough for relational report rookies and will delight new users with its capability to produce presentation-quality reports from DBF files. The native X-Base code generator for this version of R&R is still a few months down the road, according to Concentric. Nevertheless, for \$249, R&R 4.0 is a must see for any application developer or information service developer.

Concentric Data Systems Inc., 110 Turnpike Road, Westboro, MA 01581; (800) 325-9035.

— Ellen Sander

## WINDOWS COMMUNICATIONS SOFTWARE

## Crosstalk for Windows 1.2 May Be Less Compatible Than Other Crosstalks

**T**he new release of Crosstalk for Windows suffers from a "brand-name syndrome." This is where a company, in this case Digital Communications Associates, attaches a prominent name to a product that doesn't have much in common with its better known "kin."

That doesn't make the new Crosstalk for Windows a bad product. In fact, it's the communications program I use most often. But if you're expecting compatibility—even at the command level—with Crosstalk Communicator or Crosstalk Mk.4, think again.

The Crosstalk standard connect/disconnect key, F6, became Ctrl-Shift-F6 in the new release. That may seem like a small change until you realize the developers swapped a one-finger command for a three-finger, two-handed salute.

Crosstalk for Windows's scripting language is still not compatible with CASL, the language used by Crosstalk Mk.4 and Communicator, which in turn is incompatible with SISL, used by DCA's gateway products. I would love to be able to run CASL scripts in Windows, but there

are some significant technical hurdles for Crosstalk's developers to overcome.

New features in Version 1.2 include support for Novell's asynchronous server and communications server interfaces (NASI/NCSS), which give network users access to shared modems. VAX users will appreciate the VT220 and VT320 emulation, while the new Ymodem-G protocol supports error-correcting modems.

The installation program has been improved and Crosstalk for Windows now offers a collection of icons, which can be used to start communications sessions.

With a list price of \$195, Crosstalk for Windows, Version 1.2 doesn't compete for features with industrial-strength programs such as FutureSoft's Dynacomm and Microcom's Relay Gold for Windows. But if your needs are centered on dial-up connections—like mine—Crosstalk for Windows gets the job done with little fuss.

Digital Communications Associates Inc., 1000 Alderman Drive, Alpharetta, GA 30024-1199; (800) 348-3221.

— David Coursey

## MACRO UTILITY

## Key Watch Takes the Drudgery Out of Repetitive Tasks by Remembering Patterns of Keystrokes

**C**ursor over two, down one, delete, over one, insert. Cursor over two, down one, delete, over one, insert.

You might be moving a line of symbols in a word processor, shifting figures in a spreadsheet, or deleting files in a disk manager. Whichever, it's downright drudgery. And it doesn't matter how many times you repeat the pattern, the computer doesn't know what your next keystroke is going to be.

Word processors, spreadsheets, and other applications simply aren't designed to guess. But Key Watch, a new program from Micro Logic, is designed to do just that.

Once you've installed Key Watch, the program keeps an eye on your keystrokes.

Whenever it detects that a pattern of keystrokes has been repeated, the program beeps. That lets you know that if you want to continue the pattern, all you have to do is hit Alt-F5 and Key Watch will insert the entire sequence. You can also use Key Watch as a one-item glossary for inserting boilerplate text. Just hit Alt-F6, type the sequence, and hit Alt-F6 again. The text is now available with the Alt-F5 command.

The nice thing about Key Watch is it's virtually invisible unless it's offering to help. Load the program with your AUTOEXEC.BAT file and you can forget about it until Key Watch detects that you're threatened with the tedium of repetitive keystrokes. And many users will be surprised to find how often that occurs. The program requires almost as little RAM as it does attention—only 3K.

Key Watch does have many of the drawbacks of RAM-resident utilities. It won't work at all with Windows applications such as Excel, which grab control of memory and the keyboard buffer. And Key Watch is, in fact, quirky with some DOS programs and even with some Microsoft Word for DOS, for example, the program records most keystrokes but not space bar or cursor-key strokes. Unfortunately, Micro Logic does not document known incompatibilities.

At \$69.95, Key Watch is almost worth the price just to find out exactly how often you are repetitively entering keystrokes. It can be amazing to learn how much time we all spend performing repetitive actions. If you are doing it more than very rarely, the program can save you a lot of time and tedium.

Micro Logic, P.O. Box 70, Hackensack, NJ 07602; (201) 342-6518.

— Patrick Marshall

## GRAPHING PROGRAM

## QuickGraph Plus Offers Flexible Graphics, Output Capabilities

**I**saw a colorful demo recently of an interesting product for DOS and Windows called QuickGraph Plus. It's a \$149.95 business graphing program that builds a number of different kinds of graphs, including three-dimensional graphs and artful, tiled collections of graphs. The program also makes it easy to hot-link data and graphs, and you can set up an automated method for appending data within databases to a large time-series file. Time-series data can then be built into graphs; the result is that you can automate graphical representations of frequently updated data.

QuickGraph Plus exports graphs in WordPerfect vector and bit-map formats, Wordstar PIX format, PC Paintbrush PCX format, and TIFF format, so you

can easily merge your graphs with other documents.

QuickGraph Plus produces area, bar, column, line, pie, point, scatter, bubble, high-low, table, and forecast graphs in two-dimensions. It creates area, line, bar, column, and pie with Z-axis charts in three dimensions. You can annotate graphs with text, scaling, and control over legends, grid and tick marks, axis styles, and fonts. Another handy feature is that multiple charts can be printed neatly on one page. Also, by installing QuickGraph Plus in WordPerfect's Program Manager shell, users can hotkey between WordPerfect and QuickGraph. This makes it an easy process to bring graphs into WordPerfect documents.

Some programs seem to stand out for

their little touches and this one does too, with its unique sideways printing. QuickGraph Plus has a feature called bar-native-style charts printed sideways; these charts can display up to 2,250 data points; they're ideal when a standard page does not provide adequate space.

Spreadsheet vendors have already wised up to the need for flexibility in graphics output, as users of Lotus 1-2-3's automatic resizing feature can attest. QuickGraph Plus' approach to building graphs aims for flexibility, too; if you crunch and graph numbers, it may be the program for you.

Sumak Enterprises Inc., 39 Dawson Drive, Sudbury, MA 01776; (508) 443-5970.

— Sebastian Rupley



## Unfortunately, everyone working with your company's data may not be working with your company.

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DiskLock doesn't let anyone into your system without your password. It automatically locks your drive when you turn off your computer, and you can set it to lock when your PC has been idle for a specified time.

And when it locks, it locks. DiskLock lets you choose from three levels of security, including the government standard, DES encryption. That's serious protection.

DiskLock works transparently, so you can work without interruption. You can lock only your drive, or you can lock your drive and individual directories or files. And it automatically logs unsuccessful entry attempts.

You won't find better protection for your sensitive data. To find out more about DiskLock, call 1-800-759-2815.

Buy DiskLock now and get a free locking diskette box. Just write "lock box" on the registration card and return it. This is a limited-time offer, so secure one today.

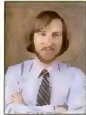
Fifth Generation Systems, Inc.  
10049 N. Reiger Road  
Baton Rouge, LA 70809  
Tech Support: (504) 291-7243





# BUYER'S ADVISORY

ANSWER LINE ■ BY BRETT GLASS



## Clearing Up the Confusion Over Intel's 80386/486 Chips

**Question:** I'm wondering if you could enlighten me about the 80386/486 and SX/DX marketing hype. I thought that the 80486 was a combination of an 80386 microprocessor coupled with a math coprocessor and some fast memory caching on a single chip. If the 486SX is a "crippled" 486 which disables the math coprocessor and cache, is it any different than an 80386DX? And what is this coprocessor they're talking about for the 486SX?

Ed Redenbaugh

**Response:** Many users have been confused by Intel's marketing maneuvers in the wake of AMD's Am386 announcements. Here's the scoop: The 486DX is not just a 386DX plus a coprocessor and cache. The CPU is a new, faster design: a 25-MHz 486 runs much faster than a 25-MHz 386. The 486SX is essentially the same chip, but it disables just the math coprocessor — not the internal cache. It still has the hot-rodded CPU and cache, so a 20-MHz 486SX (the speed that's currently shipping) is slightly faster than a 33-MHz 386DX — but, ironically, slower than AMD's Am386 clone running at 40 MHz.

There's rumored to be another 486SX in the works: the P24, which actually eliminates the math coprocessor rather than turning it off. Because it would save silicon and power, this chip would be preferable for laptops.

Finally, there's the "math coprocessor" you mentioned: the 487SX. I've put the words in quotes because the 487SX is in fact a complete 486DX — with a different pinout! When it's installed, it takes over for the 486SX and becomes the CPU for the whole system. If you think this approach sounds wasteful, you're right; it reflects the fact that all these chips are "value priced." This may soon change, however. AMD isn't the only vendor that's cloning the 386 and 486; once there are three or more players in the market, consumers will enjoy competitive chip prices based on the cost of production.

**Question:** I've been thinking of buying an additional RAM board for my AT clone. I'm running MS-DOS 3.30. Will my plans be affected by MS-DOS 5.0, and should I wait until it comes out?

A. Ek  
Pennsylvania

**Response:** There's no reason to wait for MS-DOS 5.0 to expand your computer's RAM. Since many feel that MS-DOS 5.0, with its impressive memory management features, was the force that prompted Microsoft to improve upon MS-DOS, it's reasonable to expect that MS-DOS 5.0 will also handle memory better than previous versions. However, it would be folly for Microsoft (or any vendor) to make its new OS incompatible with the RAM you buy today.

The only issue you'll want to consider when upgrading the RAM on an AT clone

is whether to buy extended or expanded memory. Extended memory is best for most applications, including Windows and programs that use DOS extenders. However, if you have an application that relies on expanded memory, you may want to invest in a memory board that can provide both.

**Question:** Where's the best place to buy RAM? How do I know if I'm getting a good price?

Name Withheld

**Response:** Because RAM is a commodity, there's not much extra value in buying it from a local dealer unless you need it installed. If you want the best deal on a standard product — for instance, 8-bit or 9-bit SIMMs — your best bet is to go mail order. Check the magazines; several RAM merchants advertise in the back of *InfoWorld*.

If you can legally avoid sales tax by buying from out of state, you'll probably save enough to cover postage — sometimes much more. But be careful: some states, such as California, have tried to force out-of-state vendors to collect sales tax, and even have a blank on their income tax returns where you're asked to report purchases from out of state. Some state legislatures have even indicated a desire to check credit card records for out-of-state purchases.

As for prices, never trust the prices in an ad; they fluctuate too quickly. Always call the merchants you're considering for quotes. Make sure those quotes include

shipping, and be sure to indicate the speed of the RAM you need. (If you're not sure, have handy one of the chips that are already installed and give them the part number.) A typical price for a 70-nanosecond 1-megabit-by-9 SIMM is \$53 — this week.

Contributing Editor Brett Glass answers reader questions on technical issues in this weekly column. Brett cannot answer questions personally and will not make brand-name recommendations. Readers can leave questions by calling (800) 227-8365, Ext. 622 or by messaging CompuServe (72267,3673).

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## RESOURCES

### ■ JUNE

**2-5, Universal City, CA:** Interactive System Corp.'s First Annual Developers' Conference. Contact: (800) 753-3400.

**3-6, San Jose, CA:** Xhibition 91 will offer tutorials, hands-on seminars, and technical program sessions on the X Window system. Contact: (617) 547-0510.

**5, Philadelphia:** The Inside Windows 3.0 conference for corporate users. Future sites include Minneapolis, Cincinnati, and Seattle. For more information, contact: (602) 998-7500; to register, call: (800) 800-3436.

**10-14, Nashville, TN:** The Usenix Association's Summer 1991 Technical Conference and Exhibition. Contact: Usenix, (714) 588-6499.

**13-14, Orlando:** The fourth annual conference of the Bynet User Group. Contact: Christine Seale, (508) 480-0840, Ext. 263.

**14-19, Anaheim, CA:** The Ninth National Conference on Artificial Intelligence. Contact: AAAI, (415) 328-3123.

**18-19, Philadelphia:** The 1991 Philadelphia Computer Conference and Exposi-

tion focuses on information systems for business and government. Contact: Sylvia Griffiths, (800) 638-8510.

**19-20, New York:** The first annual conference on downsizing in the computer industry. The conference will focus on making the migration from reliance on mainframe and distributed processing in the mini, PC, and LAN environments. Contact: (800) 345-8016.

**24-28, Santa Clara, CA:** The First Annual Windows 3.0 Developers' Conference will address topics of interest for novices and experienced Windows developers. Contact: (508) 649-9731.

**25-27, New York:** Ninth Annual PC Expo. Contact: Bruno Blenheim Inc., (800) 444-3976.

**27-29, Seattle:** Independent Computer Consultants Association's 14th annual national conference. Location: Westin Hotel. Contact: Carolyn Karelitz, (800) 438-4222.

### ■ JULY

**23-25, Santa Clara, CA:** Macivity '91: The Macintosh Connectivity Conference is a technical conference on integrating the Mac into network environments.

Contact: (408) 354-2500, Ext. 463.

**24-26, Boston:** The third annual Digital Multimedia Conference. This year's conference focuses on multimedia title, and application development. Contact: (800) 874-9980.

**29-August 2, Chicago:** Info World Chicago combines Video Expo and the CAMMP Show. Contact: JoAnn Minsker, (800) 800-KIPI.

### ■ AUGUST

**14-16, Boston:** Windows & OS/2 Conference. Contact CM Ventures, (415) 601-5000.

**19-22, New Orleans:** The eighth annual Information Center Conference and Exposition. For further information, contact: (617) 542-0146.

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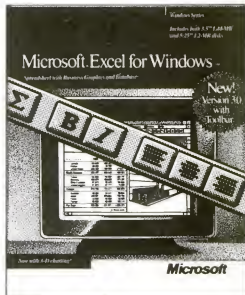
# Software Spectrum would like to give you a few pointers on Microsoft Excel for Windows 3.0.



With full mouse support and a new Toolbar™ feature, Microsoft® Excel™ for Windows™ version 3.0 gets you straight to the function you want to perform. Just point to the Toolbar button that corresponds to what you want to do and click.

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## SOFTWARE SPECTRUM

To order, call toll-free 1-800-624-0503  
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If you can shoot it on video, or can create it with your PC, then VideoVGA lets you record it to videotape or videodisc. You can even overlay graphics on live or recorded video. And because of VideoVGA's advanced encoding, the video output is a high-quality NTSC signal, not a fuzzy substitute. Your audience can see the difference, so don't blur a good message with poor output quality.

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## REVIEWS

## AST, AT&amp;T Notebooks Lead 20-MHz Market

Improved modularity, connectivity make these 386 systems stand out.

BY ROD CHAPIN AND PATRICK LYONS  
TEST CENTER

**A**ST's Premium Exec and AT&T's Safari notebooks are not just at the forefront of notebook computer development because of their 20-MHz 386SX-based power, but because they offer unique approaches to portable computing. The AST is notable because it is a system you can upgrade to from a 12-MHz 286-based system. The AT&T aims for connectivity with everything from electronic mail to hand-held pagers.

AST's notebook has one of the most intelligent designs we've seen. We looked at the 386SX/20 version of the machine, but the Premium Exec can also be purchased with a 12-MHz 286 processor that can later be upgraded. The 386SX system comes with 2 megabytes of RAM standard and a 20-megabyte hard drive.



The AST machine is extremely low-priced for a 386SX 20-MHz notebook, at less than \$3,000.

You can also purchase the computer with a 40- or 60-megabyte drive.

AST's Safari notebook gets into new territory. Most immediately striking is its attractive design. The communications extras that the Safari offers are unusual as well: The machine's software aims for easy communications via AT&T's Easy-Link electronic messaging service, and the notebook will work with Mobox — a mobile mailbox designed to work in conjunction with a third-party pager.

The Safari is a 20-MHz 386SX system that has 2 megabytes of RAM and a 40-megabyte hard drive standard. The machine can be upgraded with 2- and 4-megabyte RAM cards, and two nickel-cadmium battery packs team up for extremely long battery life.

Scoring criteria for this comparison are based on previous criteria set up for notebook computers, as detailed in our most recent comparison on 286 notebooks (May 6, Page 59). We have not

scored previous 386SX-based portables according to our new test plan, so the benchmarks that appear with this dual review refer only to the two systems.

**PERFORMANCE:**

**CPU-intensive speed:** The AST was slightly faster than the AT&T in CPU-intensive speed, with a time of 00:38:47. The AT&T was just a hair behind with a time of 01:03:32.

**Disk-intensive speed:** The AT&T Safari was somewhat faster in these tests than the AST. The Safari posted a time of 00:53:42, while the AST came in at 01:10:32.

**Windows test:** We ran Microsoft Excel 3.0 under Windows. The AST was slightly faster than the AT&T at this test. The Premium Exec had a time of 00:01:34, while the Safari completed the test in 00:01:47.

**Software compatibility:** The AST passed all our compatibility tests except for a minor problem with Desquiv. When running Desquiv with QEMM-386.SYS, it may take more than a minute to load. We also found it to be very slow when switching windows. Technical support personnel confirmed the problem and are currently working on a solution.

The AT&T Safari ran all our applications perfectly.

**Size and weight:** Weighing in at 7 pounds, 4½ ounces without power supply, the AST Premium Exec comes in right around the midrange. (The machine is 8 pounds, 15½ ounces with the power supply.) The dimensions, 11.4 inches by 9 inches by 2½ inches, make the AST thicker than some but give it a reasonably small footprint. The Safari weighs just over 7 pounds with both batteries installed and is very manageable; with power supply the system weighs about 9 pounds. At 9½ inches by 12 inches by 1.8 inches, the Safari is small and thin.

**Battery life:** Our battery life tests for the AST gave it a respectable time of 2 hours and 33 minutes. The setup provides control for hard disk time-out and screen time-out, but the CPU sleep option must be loaded from a driver occupying conventional memory. Users who install the driver may get greater battery life. (We didn't test with it loaded.)

Two nickel-cadmium batteries come with the Safari. The batteries lasted a whopping 3 hours and 56 minutes.

**Capacity:** The Premium Exec comes standard with 2 megabytes of memory expandable to 8, a 20-megabyte hard drive with optional 40- or 60-megabyte drives, and a 1.4-megabyte 3½-inch floppy. This system's unusual capacity-oriented bonus is that the 12-MHz 286-based version of the system is easily upgradeable to a 386SX system.

The Safari has a 40-megabyte hard disk, 2 megabytes of RAM standard, and the machine can be upgraded with 2- or 4-megabyte RAM cards to 6 megabytes. These RAM cards make the Safari one of the easiest machines on which to perform a RAM upgrade. The Safari has a 1.4-megabyte 3½-inch floppy, and a system with an 80-megabyte hard disk will be available soon.

**Screen readability:** AST's VGA backlit film superwrist LCD has a resolution of 640 by 480 and 32 gray scales. The screen measures 8½ inches diagonally and is quite clear with very dark letters, although there is some visible darkening at even slight angles.

The AT&T's 640-by-480 resolution VGA backlit LCD is very sharp, clear, and has extraordinary contrast. The screen measures 10 inches diagonally, and the contrast and brightness knobs give infinite control of the display quality. Within applications, the screen shows 32 gray scales smoothly and has great readability. As one of our first users of this system noted, though, the appearance of Microsoft Word on this system is much better with AT&T's provided drivers. Using these drivers you may find that DOS applications need color remapping.

**Keyboard:** The AST keyboard has a firm feel and a short keystroke, similar to Compaq's notebooks. The keyboard has well-placed keys and none that are terribly underused. Even the function keys are close to the size of the letter keys. Although the right Shift key is one full key size, making it two full key sizes (as with many other notebooks) would improve its functionality.

The AT&T's 82-key keyboard has a long, smooth action to it. The modular design and logical placement of the cursor keys make the keyboard enjoyable to type on. The function keys are half-size. There



The AT&T Safari, with its dual nickel-cadmium battery packs, ran almost 4 hours on battery power.

is a numeric keypad that is overlaid into the right portion of the alpha keys, and much of the Safari's system power management I/O redirection can be accessed through proprietary function keys, if you choose not to use AT&T-provided software.

**DOCUMENTATION:**

The manual for the AST is well-indexed and the layout is easy to read. The level of detail is skimpy sometimes, but the illustrations are top-notch.

The documentation for the Safari is very clear, concise, and detailed with fairly explicit illustrations. There are two manuals: A users' guide and a smaller portable pamphlet that summarizes the Safari's keystrokes for quick reference. A glossary and index are provided along with a decent troubleshooting guide.

**EASE OF USE:**

AST's intelligent design adds to the notebook's ease of use. Although the system lacks a handle, and the machine's thickness may make it difficult to fit in a briefcase, it is easy to carry. One minus is that you cannot configure the CPU sleep function from system setup.

The AT&T Safari comes with a useful handle, helpful accompanying software,

**BENCHMARKS****INFO  
WORLD****386SX 20-MHz Notebook Computers**

	AST Premium Exec	AT&T Safari
Battery life	2:33:33	3:56:33
Speed scores		
CPU-intensive speed	0:58:47	1:03:32
Disk-intensive speed	1:01:32	0:53:42
Windows tests	0:01:34	0:01:47
dBase III Plus	0:31:43	0:34:51
dBase IV 1.1	0:16:06	0:18:51
Lotus 1-2-3 2.2	0:24:11	0:24:47
Lotus 1-2-3 3.0	0:32:53	0:36:52
WordPerfect 5.5	0:01:43	0:01:53
Paradox	0:13:43	0:16:28

All times in hours:minutes:seconds.

**ALSO IN THIS SECTION**

Hewlett-Packard LaserJet IIIP .....	149
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and the setup consists of little more than plugging in the AC/DC converter and booting. The unit comes preformatted with DOS 4.01 and boots into Microsoft Windows 3.0 running AT&T's own "TourGuide," which is an application tailored to the Safari that helps guide you through the system.

#### SERVICEABILITY:

**System design:** The Premium Exec's workmanship is outstanding. It has strong hinges and a solid latch. There is a sturdy cover for ports, peripherals, and

the battery.

The Safari's design is sound and logical. All the controls are easily in reach and intelligently placed. The power switch, screen latch, and power management keys are colored in a pastel green that make the switches easy to find. All of the ports are easy to access in the rear, and the Modem port, RAM covers, and screen all close and latch firmly.

**Support policies:** AST provides a one-year warranty and direct, toll-free support from 6 a.m. to 5 p.m. Pacific time, weekdays; support is also available on Satur-

day. It also offers BBS and fax support, but AST does not offer a money-back guarantee or free on-site service.

AT&T has a one-year warranty for the Safari and offers direct, toll-free support 24 hours a day, seven days a week. The company does not offer free on-site service or a money-back guarantee.

**Technical support:** AST's technical support personnel were immediately available and gave us extremely competent help.

We contacted AT&T technical support to resolve two questions on power management. Although there were minimal waits, we got accurate answers to our questions.

#### VALUE:

At \$2,995 the AST Premium Exec is one of the lowest priced notebooks in its class. The AT&T Safari is considerably more expensive, with a list price of \$5,399, but it comes with two batteries, a 2,400-bps modem, and a bigger hard drive. (The upcoming system, with an 80-megabyte hard drive and 4 megabytes of RAM, will list for \$6,399.) Unlike the AT&T, which offers a 40-megabyte hard disk standard, the AST has a 20-megabyte drive standard. Both systems come with 2 megabytes of RAM, but the AST is expandable to 8, while the AT&T is expandable to 6. The AT&T comes with DOS 4.01, Windows 3.0, and AT&T's Access Plus communications program preloaded.

The AT&T Safari is expensive in spite of its power and the extras that come with the system. If you plan to take advantage of the extras, such as using AT&T's Easy-Link messaging service, the price may be more justified, but recent industry cuts in high-end notebook prices bring into focus the Safari's high price. □



## Your Left Brain Needs Clipper.

Organization is everything in business. The left side of your brain knows this. It wants order. Economy. Precision. All reasons your left brain appreciates Clipper 5.0, the premier application development system for PCs.

An open architecture programming system, Clipper provides a flexible environment for developing precisely the application you need, not a messy approximation. Its user-definable commands and functions let you configure the Clipper language for your exact requirements. Its compiler generates .EXE files for rapid execution and cost-free distribution. Its new linker even lets you build and run applications larger than available memory! And its elegant network support yields high performance even on the largest systems.

So, if you're charged with coaxing order out of chaos for your business, put Clipper in your programming arsenal today. It has exactly the programming power you need!

## Clipper 5.0

The Application Development Standard

213/390-7923

Ask For Department-M

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## REPORT CARD INFO WORLD

### AT&T Safari 386SX/20

Criterion	(Weighting)	Score
<b>Performance</b>		
CPU-intensive applications 1:03:32.	(100)	Excellent
Disk-intensive applications 0:53:42; fastest.	(100)	Excellent
Windows test 0:01:47.	(50)	Excellent
Software compatibility	(50)	Excellent
Size/weight 7 pounds, with batteries.	(75)	Satisfactory
Battery life 3:56:33; outstanding.	(75)	Excellent
Capacity 2 megabytes RAM, expandable to 6; 40-megabyte hard drive standard.	(50)	Very Good
Screen readability	(75)	Very Good
Keyboard	(50)	Good
Documentation	(50)	Very Good
Ease of use	(50)	Very Good
<b>Serviceability</b>		
System design	(50)	Very Good
Support policies	(50)	Good
Technical support	(25)	Satisfactory
<b>Value</b>	(150)	Satisfactory
<b>Final score</b>		<b>7.6</b>

#### PRODUCT SUMMARY

**Company:** AT&T Computer Systems, 1 Speedwell Ave., Morristown, NJ 07960, (800) 247-1212.

**List Price:** \$5,399 (including 40-megabyte hard drive).

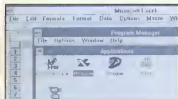
**Features:** 20-MHz 80C386SX; one serial port; one parallel port; 640-by-480 resolution VGA-compatible LCD; twin independent batteries; LCD system status display; external VGA port; external keyboard/mouse port; coprocessor support.

**Storage and Memory:** 40-megabyte 3 1/2-inch hard disk; 1.4-megabyte floppy drive; 2 megabytes of RAM.

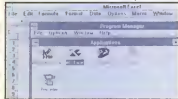
**Pros:** Creative design; Windows and 2,400-bit-per-second modem come standard; great-looking screen.

**Cons:** Relatively expensive.

**Summary:** The Safari is a speedy and expandable system with unusual communications options, such as links to electronic mail and pagers.



The AST has a clear VGA display that appears darker when viewed from angles; the function keys are large-size.



The AT&T has a VGA, backlight, 640-by-480 LCD; it has an 82-key keyboard with half-size function keys.





# REPORT CARD INFO WORLD

## AST Premium Exec 386SX/20

Criterion	(Weighting)	Score
<b>Performance</b>		
CPU-intensive applications	(100)	Excellent
0:58:47, Fastest.		
Disk-intensive applications	(100)	Excellent
1:01:32.		
Windows test	(50)	Excellent
0:01:34.		
Software compatibility	(50)	Very Good
Size/weight	(75)	Satisfactory
7 pounds, 4½ ounces with battery.		
Battery life	(75)	Good
2:33:33.		
Capacity	(50)	Very Good
2 megabytes RAM expandable to 8; 20-megabyte hard drive standard.		
Screen readability	(75)	Good
Keyboard	(50)	Good
Documentation	(50)	Good
Ease of use	(50)	Good
<b>Serviceability</b>		
System design	(50)	Very Good
Support policies	(50)	Very Good
Technical support	(25)	Very Good
Value	(150)	Excellent
Final score		<b>7.8</b>

### PRODUCT SUMMARY

**Company:** AST Research Inc. 16215 Alton Parkway, P.O. Box 19658, Irvine, CA 92713-9658; (714) 727-4141.  
**List Price:** \$2,995.  
**Features:** 20-MHz 80386SX; one serial port; one parallel port; one external VGA monitor port; one external keypad/keyboard/mouse port; coprocessor slot.  
**Storage and Memory:** 2 megabytes RAM, expandable to 8; 20-megabyte hard drive, 40 or 60 megabytes optional; a 1.44-megabyte 3½-inch floppy.  
**Pros:** Wide range of configurations; 20-MHz processing power; smart design; low price.  
**Cons:** Somewhat bulky for briefcase; screen dark.  
**Summary:** This fast and dependable notebook comes in a 12-MHz 286-based version that can be upgraded.



# LaserJet IIIP Tops 'Personal' Printer Rivals

Enhancements present in the IIIP model contribute to quicker speed.

By JEFF ECKERT TEST CENTER

Hewlett-Packard Co. has rounded out its line of PCL5 printers with the release of the IIIP. This printer is the updated version of the IIP, which defined the personal laser printer market. Like its predecessor, the IIIP has kept pace with HP's superlative line of products that offer PCL5 and RET (Resolution Enhancement Technology). The IIIP also contains other benefits to PCL5. (This review is based on criteria established in our comparison of low-cost LaserJet II compatibles, October 8, 1990, Page 77.)

The IIIP, built around the Canon four-page-per-minute (ppm) engine, is the little sibling of the LaserJet III. The printer runs under PCL5, the chief benefits of which are scalable fonts, HP-GL/2 (vector graphic language), and improved speed performance because of additions to the PCL5 technology.

### FEATURES:

Adaptive compression is one significant addition to PCL5. With Adaptive Compression, the three raster compression models (Run-Length Encoded, TIFF, and Delta Row) are intelligently controlled; each is called upon to compress individual lines of raster images. However, with the IIIP, these individual compressed raster lines are bundled into blocks before they are sent to the printer. In a nutshell, printer memory is freed up by Adaptive Compression, and this is certain to lead to further development on the part of HP and software developers.

User-defined fill patterns are new to PCL5. This allows the user to define the fill pattern to be used for either a font or graphic. In the LaserJet III family, there were only 16 predefined fill patterns.

The final features are easier to explain together: soft symbol sets and unbound scalable fonts. The IIIP allows printer-driver authors to customize symbol sets (selecting different symbols from a variety of sets or adding their own downloaded "soft" symbols) to suit an application's needs. This enhancement, called soft symbol sets, in effect relieves applications of the need to switch symbol sets mid-stream in order to access characters from different sets — a process cumbersome enough to deter most programmers. To date, once implemented into drivers, unbound scalable fonts will make the process of selecting symbol sets transparent to the end-user. In addition, this frees up memory and optimizes I/O transfer by removing redundant characters across symbol sets.

The font scaling incorporated in the IIIP, like that of the LaserJet III, is Agfa-Compugraphic's Intellifont. Intellifont allows fonts to be scaled from 0.25 to 999.75 points. Like PostScript, the Intellifont technology allows styles to be applied to the scalable typefaces along with special effects such as patterned characters and shadowing. HP claims to have boosted the HP-GL/2 vector-graphic language providing for increased throughput of line art and image processing between 15 and 20 percent.

HP has integrated a faster processor in the IIIP, stepping up from the 10-MHz version to a 16-MHz chip. HP has also implemented a faster parallel I/O, which

the company reports is up to four times faster than the IIP.

### PERFORMANCE:

**Compatibility:** The IIIP handled Genoa Technology's LaserJet Series II compatibility tests with no significant problems. The differences we found were the result

of enhancements, such as additional fonts or symbol sets, and font scaling.

**Image quality:** Graphics and text image quality in the IIIP are top flight. TIFF images were rendered with exceptional halftones, while Lotus PIC files print with clarity equalled only by the LaserJet III and IIID.

NOW SHIPPING  
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Upgrade Now!

## Your Right Brain Wants It!

While your left brain duly notes the benefits of Clipper programming, the right half is wild about how you get them! Imagine a programming environment with no limits! The language can be easily extended with your own routines and you can even integrate code from other languages, like C and Assembler. You're always free to configure Clipper to suit your own programming style.

Hey, let's say you want to read and write data in some format other than the .dbf structure Clipper already supports. It's no problem since Clipper 5.0 sports a replaceable database driver, even allowing multiple drivers to be used concurrently in the same application! There's no end to the possibilities you can pursue with Clipper!

Clipper's open architecture system will fire your imagination with unparalleled freedom. It's spray paint for a developer's mind. So, if you want your imagination to inspire your applications, indulge yourself with Clipper 5.0. It has everything you need and anything you'd want.

## Clipper 5.0

The Application Development Standard

213/390-7923

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**Speed:** To date, the IIIP is the fastest affordable laser printer we have tested when it comes to graphics print speed. The IIIP print times in our Ventura tests were in a class of their own when compared to other printers priced under \$1,600. The times were also faster than both the LaserJet III and IIID. Lotus 1-2-3 times were middle of the pack. Text print times did not speed up; they were almost identical with the IIP.

**Font handling:** Scalable fonts, proprietary bit-mapped fonts, printing in multiple orientations, font cartridge support, and numerous third-party products combine to place the IIIP head and shoulders above the competition for font handling.

The Hewlett-Packard PostScript cartridge is also an option for the IIIP; it lists for \$695.

**Expandability:** The IIIP comes standard with 1 megabyte of memory and can be expanded up to 5 megabytes. Numerous paper trays are optional, including envelope and European sizes. The IIIP can be configured so that both the fold-down tray and optional lower cassette are active to access different paper sizes. An AppleTalk interface is an option.

#### DOCUMENTATION:

Three manuals comprise the documentation: a getting started guide, a user's



For the IIIP printer, Hewlett-Packard has enhanced its PCL5 technology with additions such as user-defined fills and adaptive compression.

#### REPORT CARD

##### LASER PRINTER

### HP LaserJet IIIP

Criterion	(Weighting)	Score
<b>Performance</b>		
Compatibility	(125)	Excellent
No anomalies to affect performance.		
Graphics image quality	(75)	Excellent
Bold blacks; TIFF image has smooth grays; PCL file clean and readable.		
Graphics speed	(75)	Excellent
Fastest Ventura times in the market.		
Text image quality	(75)	Excellent
RET contributes to finest output in the class.		
Text speed	(75)	Satisfactory
Times are almost identical to IIP.		
Font handling	(75)	Excellent
Two scalable typefaces; font rotation; scalable cartridges available; soft fonts supported.		
Expandability	(75)	Excellent
Numerous paper tray options; expandable to 5 megabytes; tremendous third-party support.		
Documentation	(50)	Excellent
The best among laser printers.		
Setup	(50)	Excellent
Ten-minute setup.		

## INFO WORLD

**Ease of use** (75) Excellent  
One-piece consumables; duty cycle 8K per month.

**Serviceability** (75) Excellent  
Workmanship  
Surface-mount components; clean electronics; small footprint.

**Support policies** (50) Good  
One-year warranty; support 7 a.m. to 6 p.m. Mountain time.

**Technical support** (50) Excellent  
Per reader survey.

**Value** (75) Excellent

**Final score** **9.4**

#### PRODUCT SUMMARY

**Company:** Hewlett-Packard Co., 19310  
Purview Ave., Cupertino, CA 95014;  
(800) 752-0900.

**List Price:** \$1,595.

**Pros:** Magnificent output quality; font scaling; graphic print speed; strong documentation; easy to use.

**Cons:** Text print speed not as competitive as graphics; drivers need to be developed to take advantage of PCL5 enhancements.

**Summary:** HP provides a standard-setting personal laser printer. There is no better choice in the affordable market than the IIIP.

After the meeting, Steve told Jack,  
"My LaserJet will call your LaserJet."



Your HP LaserJet is now a mailbox. Because with Hewlett-Packard's new LaserJet FAX, you can send facsimiles directly from your PC—or your original paper copy—and receive faxes on an HP LaserJet printer. Right at your desk.

With the HP LaserJet FAX, what you print on your LaserJet printer is what you fax.

So pages are received with their formatting, fonts, and photos looking just like the originals. Even when sent from your PC.

If HP LaserJet FAX devices are installed at both ends, you can send and receive faxes that are identical to the originals. And because you print on plain paper, you won't have to contend with the curling thermal

paper that jams in your copier. You can also transmit to a traditional fax machine with improved quality.

The best part is that you can get all of this from your existing HP LaserJet printer. To receive a sample fax, and to find the location of your nearest authorized HP dealer, call 1-800-752-0900, Ext. 2295.

Circle 86 on reader service card

## BENCHMARKS

INFO  
WORLD

## Hewlett-Packard LaserJets

	IIIP	IIIP <sup>1</sup>	IIIP <sup>2</sup>	IIIP <sup>3</sup>
<b>Graphics printing</b>				
Xerox Ventura Publisher	2:30	2:55	2:44	4:09
Lotus 1-2-3	2:34	2:22	2:20	2:37
<b>Text printing</b>				
Microsoft Word	1:32	0:51	0:52	1:32
Page-per-minute test*	3.9	8.1	7.4	3.9

Times in minutes:seconds.

Products were tested on an 8-MHz IBM AT. I/O transfer will be significantly quicker on a 386 machine.

<sup>1</sup>Reviewed February 4, Page 87.<sup>2</sup>Reviewed March 19, 1990, Page 76.<sup>3</sup>Reviewed October 8, 1990, Page 77.

\*Twenty-page ASCII dump, not counting the first page.

guide, and software application notes. The users' guide offers all the necessary items for smooth use of the printer in addition to an informative discussion of laser technology, type and its use, and ozone emissions. The software application notes lead you through configuring the IIIP for most major applications and working with fonts.

**SETUP:**

The IIIP's 10-minute setup entails removing one shipping restraint, inserting the one-piece consumable, then plugging in the power cord and connecting the printer cable. If you need to configure the printer for a different I/O, the getting-started

guide provides the best help that we have seen.

**EASE OF USE:**

The IIIP's control panel may be configured in one of 10 different languages, including French, Spanish, and German. Consumable replacement is the easiest of any printer on the market, as it is only a single, compact piece.

HP has a winner with the IIIP, following in the fine tradition of the IIP. Offering superlative print quality, quick graphic handling, and numerous features to please most single users. For the money there is no better laser option than the IIIP. □

## REVIEW RESPONSES

**Peers vs. Clients**

One review topic that is of interest to many people may have escaped you. Although the de facto standard LANs get reviewed and compared to each other, one unanswered question is "How do peer-to-peer LANs compare to the three big client/server LANs?" (i.e., Novell NetWare, Microsoft LAN Manager, and Banyan Vines).

In trying to determine what is best for small-business clients, local area networks such as LANtastic, Invisible Net, and others are attractive from a price standpoint, but just how much in speed and functionality might they be losing in performance compared to NetWare and the others?

Especially now that Novell has announced a replacement for ELS systems, it would be most informative to run a comparison of several peer-to-peer LANs to the latest Novell 286 system, run both as peer to peer and with a dedicated server.

Although I have installed both LANtastic and Novell ELS LANs, I cannot provide actual numbers showing performance running the same software, and may not be completely aware of the difference in functionality, either. I would very much like to see your Test Center perform such a comparison.

John R. Robinson  
Waterloo, IA

We plan to publish a product comparison of peer-to-peer network operating systems in our July 8 issue. We will examine LANtastic and several competitors, including Hayes LANstep, and report on the relative value and performance of peer-to-peer vs. client/server LANs. — Editors

**Emissions Tests**

Your product comparison of color VGA monitors (March 18, Page 53) missed an important feature that should be considered by everyone who works in front of a computer monitor: video display terminal (VDT) emissions. The FCC test for radio frequency interference is not a test for VDT.

Perhaps you could produce a VDT specification to help your readers who are concerned about the health hazards from monitor emissions.

Dennis O'Leary  
Northridge, CA

In our Perspectives section of November 12, 1990, Page 73, we discussed several health risks of computing, including measurements of VDT emissions. One difficulty with this type of test is that although we can report emissions levels, we cannot draw a meaningful conclusion due to the lack of knowledge of the long-term effects of monitor radiation. — Editors

Introducing plain paper faxing  
for your HP LaserJet printers.

The new HP LaserJet FAX.



HP Peripherals  
When it's important to you.



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PACKARD

**PostScript for \$1,000**

I appreciated your product analysis of Printer Languages in the March 11 issue (Page 55). I feel, however, that you have done a disservice to your less affluent readers by implying that you could only get PostScript with one of these higher priced printers.

I have been able to achieve true PostScript printing for about \$1,000. I bought an Okilaser 400 with an extra megabyte of memory, and QMS' UltraScript software, which allows any printer

with HP LaserJet emulation to act like a PostScript printer. This combination is much slower, but if you only need PostScript occasionally, then UltraScript is a viable alternative.

Paul M. Lieberman  
Alton, VA

**Further Assurance**

Borland International has agreed to the terms of *InfoWorld's* Buyers Assurance Seal for its Windows development tool, ObjectVision, reviewed May 13, Page 89.

**Correction**

In the May 6 product comparison of 286 notebook computers (Page 59), we published an incorrect phone number for Compaq. The correct sales information number is (713) 370-0670.

*InfoWorld* welcomes comments about its reviews. Letters are subject to editing for space and clarity. Please address correspondence to the Reviews Editor, *InfoWorld*, 1060 Marsh Road, Menlo Park, CA 94025.

# Hard Disks Die.

Hard disk manufacturers want us to believe that hard disk technology is absolutely reliable ... but experience teaches otherwise. We depend upon data storage to be flawless, but hard disk technology isn't. Surface defects, head alignment drift, and low-level format aging cause hard disks to fail.

A hard disk drive's low-level format fades with use. The drive's read/write heads lose their delicate alignment and move away from the original low-level format information. These new data track locations intersect unseen surface defects that were once harmlessly located between tracks. DOS's chilling "Abort, Retry, or Fail?" message inevitably results. Precious data is soon lost.

If left unchecked, data storage becomes more an act of hope and faith than one of science.

**A return to science.** The problem is known and understood, and the solution is clear. While a drive's data can still be read, the drive must be given a new, realigned and strong low-level format. Then all current surface defects must be located and managed.

This process prevents hard disk data loss.

**An act of prevention.** Gibson Research Corporation's SpinRite™ software program reads hard-to-read and impossible-to-read data from a DOS hard disk, nondestructively low-level reformats the drive's surface while optimizing the sector interleave factor, analyzes and scrubs each track of the drive for surface defects, and relocates any endangered data to safety. SpinRite easily restores hard disk drives to better-than-new condition with their data intact. Before any data is lost, SpinRite detects that a drive is "softening" then determines and eliminates the cause. SpinRite readily recovers data the system cannot read.

SpinRite won Byte Magazine's prestigious Award of Distinction and continues to win computer industry praise and acclaim. It has proven itself to be effective in preventing hard disk failure. SpinRite will work for you.

SpinRite II features a detailed technical log, as well as support for DOS 4 and large device driver partitions. It is available immediately from local software retailers or directly from Gibson Research with a 30-day satisfaction guarantee.

Suggested retail price: \$89.

To receive additional literature or to purchase SpinRite II, call toll-free:



## SpinRite II.

A return to science.  
An act of prevention.



## InfoWorld Guide to Reviews

**REVIEW SCORING**

*InfoWorld* reviews only finished, production versions of products, never beta-test versions.

Products receive ratings ranging from unacceptable to excellent in various categories. Scores are derived by multiplying the weighting (in parentheses) of each criterion by its rating, where:

**Excellent — 1.0** — Outstanding in all areas.

**Very Good — 0.75** — Meets all essential criteria and offers significant advantages.

**Good — 0.625** — Meets essential criteria and includes some special features.

**Satisfactory — 0.5** — Meets essential criteria.

**Fair — 0.25** — Falls short in essential areas.

**Unacceptable or N/A — 0.0** — Fails to meet minimum standards or lacks this feature.

Scores are summed, divided by 100, and rounded down to one decimal place to yield the final score out of a maximum possible score of 10 (plus bonus). Products rated within 0.2 points of one another differ little. Weightings represent average relative importance to *InfoWorld* readers involved in purchasing and using that product category.

You can customize the report card to your company's needs by using your own weightings to calculate the final score.

Average score for all products reviewed in 1990: 6.8.

**INDEXES**

Indexes appear in the first issues of January, April, July, and October. For back issues, specify dates and send \$2.95 per issue to *InfoWorld* Customer Service, P.O. Box 3014, Northbrook, IL 60065. Please allow six weeks for delivery.

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*InfoWorld* publishes each year in-depth reviews and product comparisons of approximately 1,000 microcomputer products that we judge to be important, interesting, and useful to our readers. To submit a product for review consideration, send product announcements, marketing materials, demos, or advertising copy describing the product to Reviews Editor, *InfoWorld*, 1060 Marsh Road, Menlo Park, CA 94025. (Send news and new product announcements separately to News Editor.) Please do not send hardware. Unsolicited materials are not returned.

The editorial review board selects products for review for each cycle. If your product is selected, you will be contacted to arrange shipment of the product for review. We request two copies of software; we return hardware, but not software, after review.

Because of the volume of submissions, we regret we are unable to contact vendors regarding products not selected for review.



# The body of a laptop. The heart and soul of a PS/2.



## INTRODUCING A PS/2 LAPTOP THAT'S FULL OF FEATURES. NOT COMPROMISES.

Making a computer light enough to take anywhere and small enough to sit on a lap isn't enough. Making it perform like one that sits on a desk is the true challenge. That's why IBM has created a computer that delivers true portability without sacrificing true performance—the Personal System/2® Laptop 40 SX. At just 7.7 pounds it's clearly a lightweight computer. But it certainly doesn't act like one.

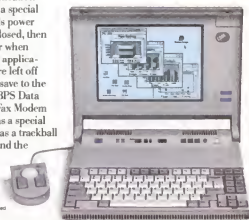
The PS/2® Laptop looks great from the outside. But its true beauty lies inside, where you'll find uncompromised computing power. It has the same 386SX™/20 MHz processor found in best-selling desktop models. A 3.5" 1.44MB disk drive and 2.5" 60MB fixed disk provide fast access to programs and data, and standard 2MB RAM is expandable to 18MB.

Instead of compromising comfort by altering the keyboard, the PS/2 Laptop has a full-size keyboard spaced and arranged the same way as a desktop PS/2's.

And instead of squeezing information onto a pint-size screen, it has a sidelit LCD that offers a 10"-diagonal viewing area. It delivers sharp, clear text and graphics with VGA quality. The PS/2 Laptop also has system status icons that monitor assorted functions and battery life. Extensive power management controls include the ability to change batteries in the middle of an application without exiting and a special feature that suspends power when the screen is closed, then returns to full power when reopened, resuming applications where they were left off without the need to save to the hard drive. A 2400 BPS Data Modem/9600 BPS Fax Modem is available, as well as a special mouse that doubles as a trackball when turned over. And the PS/2 Laptop comes with something no laptop

should be without—an international warranty\* backed by thousands of Authorized Remarketers worldwide, so service and support are never far away.

To find out more, contact your IBM Authorized Remarketer or IBM marketing representative. You'll see why with the new PS/2 Laptop, you don't need a whole lot of room to get a whole lot of computer.



How're you  
going to do it?  
PS/2 it!

**IBM**®

\*Available only in the countries in which this product is sold by IBM and IBM Authorized Remarketers. Subject to the terms of the limited warranty provided when purchased. Proof of original purchase may be required. IBM, the PS/2 System/2 and PS/2 are registered trademarks of International Business Machines Corporation. 386SX is a trademark of Intel Corp. © 1991 IBM Corp.

# INFO MARKET

Combining vision and technology, products drive the PC industry. As innovations become standards, the next revolution begins. . . . And the future history of computing is being written by the companies whose products appear in InfoMarket.

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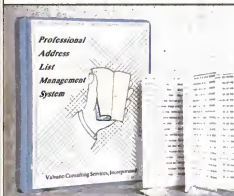
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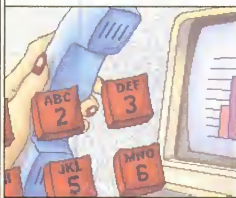
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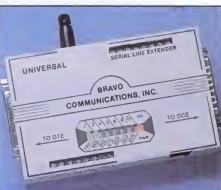
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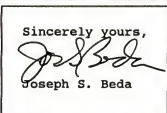


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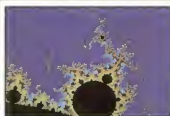
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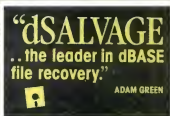
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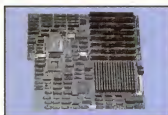
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DESKPRO 286	1MB Module	11868-001	79**
DESKPRO 286	2MB Module	11869-001	149**
DESKPRO 386	1MB Module	11869-001	149**
DESKPRO 386	2MB Module	11870-001	219**
DESKPRO 386	4MB Board	11871-001	389**
DESKPRO 386	4MB Kit	11872-001	319**
DESKPRO 386	4MB Board	11873-001	389**
DESKPRO 386	4MB Board	11874-001	389**
DESKPRO 386	4MB Board	11875-001	389**
DESKPRO 386	4MB Board	11876-001	389**
DESKPRO 386	4MB Board	11877-001	389**
DESKPRO 386	4MB Board	11878-001	389**
DESKPRO 386	4MB Board	11879-001	389**
DESKPRO 386	4MB Board	11880-001	389**
DESKPRO 386	4MB Board	11881-001	389**
DESKPRO 386	4MB Board	11882-001	389**
DESKPRO 386	4MB Board	11883-001	389**
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DESKPRO 386	4MB Board	11887-001	389**
DESKPRO 386	4MB Board	11888-001	389**
DESKPRO 386	4MB Board	11889-001	389**
DESKPRO 386	4MB Board	11890-001	389**
DESKPRO 386	4MB Board	11891-001	389**
DESKPRO 386	4MB Board	11892-001	389**
DESKPRO 386	4MB Board	11893-001	389**
DESKPRO 386	4MB Board	11894-001	389**
DESKPRO 386	4MB Board	11895-001	389**
DESKPRO 386	4MB Board	11896-001	389**
DESKPRO 386	4MB Board	11897-001	389**
DESKPRO 386	4MB Board	11898-001	389**
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DESKPRO 386	4MB Board	11900-001	389**

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TECHNOL 2000X	1MB 80	129**
TECHNOL 2000X	2MB 80	179**
TECHNOL 2000X	4MB 80	229**
TECHNOL 2000X	8MB 80	279**
TECHNOL 2000X	16MB 80	329**
TECHNOL 2000X	32MB 80	379**
TECHNOL 2000X	64MB 80	429**
TECHNOL 2000X	128MB 80	479**
TECHNOL 2000X	256MB 80	529**
TECHNOL 2000X	512MB 80	579**
TECHNOL 2000X	1024MB 80	629**
TECHNOL 2000X	2048MB 80	679**
TECHNOL 2000X	4096MB 80	729**
TECHNOL 2000X	8192MB 80	779**
TECHNOL 2000X	16384MB 80	829**
TECHNOL 2000X	32768MB 80	879**
TECHNOL 2000X	65536MB 80	929**
TECHNOL 2000X	131072MB 80	979**
TECHNOL 2000X	262144MB 80	1029**
TECHNOL 2000X	524288MB 80	1079**
TECHNOL 2000X	1048576MB 80	1129**
TECHNOL 2000X	2097152MB 80	1179**
TECHNOL 2000X	4194304MB 80	1229**
TECHNOL 2000X	8388608MB 80	1279**
TECHNOL 2000X	16777216MB 80	1329**
TECHNOL 2000X	33554432MB 80	1379**
TECHNOL 2000X	67108864MB 80	1429**
TECHNOL 2000X	134217728MB 80	1479**
TECHNOL 2000X	268435456MB 80	1529**
TECHNOL 2000X	536870912MB 80	1579**
TECHNOL 2000X	1073741824MB 80	1629**
TECHNOL 2000X	2147483648MB 80	1679**
TECHNOL 2000X	4294967296MB 80	1729**
TECHNOL 2000X	8589934592MB 80	1779**
TECHNOL 2000X	17179869184MB 80	1829**
TECHNOL 2000X	34359738368MB 80	1879**
TECHNOL 2000X	68719476736MB 80	1929**
TECHNOL 2000X	137438953472MB 80	1979**
TECHNOL 2000X	274877906944MB 80	2029**
TECHNOL 2000X	549755813888MB 80	2079**
TECHNOL 2000X	1099511627776MB 80	2129**
TECHNOL 2000X	2199023255552MB 80	2179**
TECHNOL 2000X	4398046511104MB 80	2229**
TECHNOL 2000X	8796093022208MB 80	2279**
TECHNOL 2000X	17592186444416MB 80	2329**
TECHNOL 2000X	35184372888832MB 80	2379**
TECHNOL 2000X	70368745777664MB 80	2429**
TECHNOL 2000X	14073749155328MB 80	2479**
TECHNOL 2000X	28147498310656MB 80	2529**
TECHNOL 2000X	56294996621312MB 80	2579**
TECHNOL 2000X	112589993242624MB 80	2629**
TECHNOL 2000X	225179986485248MB 80	2679**
TECHNOL 2000X	450359972970496MB 80	2729**
TECHNOL 2000X	900719945940992MB 80	2779**
TECHNOL 2000X	1801439891881984MB 80	2829**
TECHNOL 2000X	3602879783763968MB 80	2879**
TECHNOL 2000X	7205759567527936MB 80	2929**
TECHNOL 2000X	14411519135055872MB 80	2979**
TECHNOL 2000X	28823038270111744MB 80	3029**
TECHNOL 2000X	57646076540223488MB 80	3079**
TECHNOL 2000X	115292153080446976MB 80	3129**
TECHNOL 2000X	230584306160893952MB 80	3179**
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TECHNOL 2000X	922337224643575808MB 80	3279**
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TECHNOL 2000X	29514791188594425856MB 80	3529**
TECHNOL 2000X	59029582377188851712MB 80	3579**
TECHNOL 2000X	118059164754377703424MB 80	3629**
TECHNOL 2000X	236118329508755406848MB 80	3679**
TECHNOL 2000X	472236659017510813696MB 80	3729**
TECHNOL 2000X	944473318035021627392MB 80	3779**
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TECHNOL 2000X	3777892752140086509568MB 80	3879**
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TECHNOL 2000X	12089256006848276830976MB 80	4129**
TECHNOL 2000X	24178512013696553661952MB 80	4179**
TECHNOL 2000X	48357024027393107323904MB 80	4229**
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TECHNOL 2000X	77371238443828973182464MB 80	4429**
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TECHNOL 2000X	618969907550631785459712MB 80	4579**
TECHNOL 2000X	1237939815101263570919424MB 80	4629**
TECHNOL 2000X	2475879630202527141838848MB 80	4679**
TECHNOL 2000X	4951759260405054283677696MB 80	4729**
TECHNOL 2000X	9903518520810108567355392MB 80	4779**
TECHNOL 2000X	19807037041620217214710784MB 80	4829**
TECHNOL 2000X	39614074083240434429421568MB 80	4879**
TECHNOL 2000X	79228148166480868858843136MB 80	4929**
TECHNOL 2000X	158456332932961737717686272MB 80	4979**
TECHNOL 2000X	316912665865923475435372544MB 80	5029**
TECHNOL 2000X	633825331731846950870745088MB 80	5079**
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TECHNOL 2000X	5070602653854775606965960704MB 80	5229**
TECHNOL 2000X	10141205307709551213931921408MB 80	5279**
TECHNOL 2000X	20282410615419102427863842816MB 80	5329**
TECHNOL 2000X	40564821230838204855727685632MB 80	5379**
TECHNOL 2000X	81129642461676409711455371264MB 80	5429**
TECHNOL 2000X	162259284923352819422911074256MB 80	5479**
TECHNOL 2000X	324518569846705638845822148512MB 80	5529**
TECHNOL 2000X	649037139693411277691644297024MB 80	5579**
TECHNOL 2000X	1298074279386822555383288594048MB 80	5629**
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TECHNOL 2000X	5192297115547290221333155576192MB 80	5729**
TECHNOL 2000X	103845942310945804426666611533824MB 80	5779**
TECHNOL 2000X	207691884621891608853333222667648MB 80	5829**
TECHNOL 2000X	415383769243783217706666445335296MB 80	5879**
TECHNOL 2000X	830767538487566435413332890670592MB 80	5929**
TECHNOL 2000X	1661535076975132870826665811411184MB 80	5979**
TECHNOL 2000X	3323070153950265741653331622822368MB 80	6029**
TECHNOL 2000X	6646140307900531483306663245644736MB 80	6079**
TECHNOL 2000X	1329228061580106296661332648889472MB 80	6129**
TECHNOL 2000X	2658456123160212533322665297778944MB 80	6179**
TECHNOL 2000X	5316912246320425066644531195557888MB 80	6229**
TECHNOL 2000X	10633824492640850133288908911115776MB 80	6279**
TECHNOL 2000X	2126764898528170026657777782235552MB 80	6329**
TECHNOL 2000X	4253529797056340053315555544471104MB 80	6379**
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TECHNOL 2000X	6805647675290144085333977777777777MB 80	6579**
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TECHNOL 2000X	2787593510910989836533977777777777MB 80	7179**
TECHNOL 2000X	5575187021821979673066755555555555MB 80	7229**
TECHNOL 2000X	11150374443643959346133511111111111MB 80	7279**
TECHNOL 2000X	2230074888728791869226622222222222MB 80	7329**
TECHNOL 2000X	44601497765575837384533511111111111MB 80	7379**
TECHNOL 2000X	8920299553115167476906612222222222MB 80	7429**
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## Compaq

Continued From Page 1

gence, a Dallas-based PC market research firm.

American PC companies such as Compaq and IBM, stung by lower priced competitors, have reacted in recent weeks by cutting prices. The slowly recovering economy is forcing dealers to cut margins, and Compaq's poor earnings could signal even better deals, Stahel said.

Not everyone agrees with that assessment, however. "I don't think you'll see further price cuts unless dealers have excess inventory to sell off quickly," said Donald Heeter, who follows Compaq for Wessels, Arnold & Henderson, a Minneapolis, institutional brokerage firm.

Compaq president Rod Canion blamed the earnings bomb on the merging of six of the company's top 10 dealer chains, a strong U.S. dollar overseas, and a general slump in domestic PC sales. The mergers will result in a stronger dealer channel, he said.

But the short-term effect is slower orders in Compaq's traditionally strongest, busiest season of the year. Business during the quarter ending June 30 has been down 15 percent from the \$862 million recorded a year ago, Compaq said.



Rod Canion said Compaq's stock hit 'falls in the category of all-time overreaction.'

On Wednesday, Compaq shares dropped 27 percent in value, and Canion chided Wall Street for the sudden sell off.

"It's not the first time they overreacted," Canion said. "It falls in the category of all-time overreaction."

On Thursday, the company said it would repurchase up to 10 million shares of stock.

Lupatkin and other analysts believe Compaq may be caught in a technology gap as competition eats into the desktop and notebook markets, while its big system and multiprocessing business has yet to develop.

"Compaq's real problem is they allowed Dell Computer, particularly, to create the impression of better service and support for machines that are roughly equivalent to Compaq's while being significantly less expensive," Heeter said.

## Deal Won't End Businessland Woes

BY LISA PICARILLE

Businessland Inc. bought time late last week in its struggle to survive when it won temporary financing from ITT Commercial Finance, its largest creditor.

The deal is just a reprieve for the San Jose, California-based company that was once the largest U.S. PC retailer, analysts said. The company has posted nine consecutive quarterly losses and a hefty \$43 million loss in its third quarter.

"We should never say never, but the odds are extremely small that they can pull out of it," said Liz Buyer, an analyst with New York-based Cowen & Co.

"They are lying in the coffin and this is the biggest nail," said Doug Kass, an analyst with Dataquest Inc. in San Jose, California. "The ITT deal is not a saving grace — just a stopgap measure."

ITT, whose support enables the retailer to purchase products from Apple and Compaq, last Tuesday cut off Businessland's funding. But by Thursday, it had renegotiated to extend the company's credit through June 30. Another source of funds for Businessland, IBM Credit Corp. vowed to stand behind the company,

even if ITT pulled out.

Despite the financing arrangement, Businessland is considering other options, including filing for protection from creditors under Chapter 11 of the bankruptcy code while the company reorganizes.

Despite its vast problems, Businessland — with a prestigious list of Fortune 1000 clients — remains an attractive target for consolidation.

Potential buyers include systems integrators such as Electronic Data Systems or JWP of Purchase, New York.

"It's likely ITT is letting them [Businessland] fatten up for a buyout," sources said. "They bring in money until the end of June, then, if they get sold, ITT is the first to get paid."

Several problems brought Businessland to its knees. Among them is the perception that the retailer doesn't respond to customers' needs.

"They got a little pompous," said Arthur Block, a vice president at Manufacturers Hanover, which dropped Businessland a couple of years ago. "They thought they knew better than the end-user."

The 1989 split with Compaq is "the catalyst that made a bad situation worse," said Buyer.

## Businessland's Financial Downturn



Businessland's most recent losses prompted several creditors to re-evaluate the dealer's financing.

## Comdex

Continued From Page 1

tions beyond IBM and Compaq.

"Our clients are increasingly willing to buy clone manufacturers; not only the second-tier products, but the true no-name clones as well," and Comdex is where they look, said Matthew Cain, a senior research analyst for Meta Group, a Westport, Connecticut-based market research firm.

"That's absolutely what the spring show is for," Cain said. "It's a place to evaluate systems and check out the prices."

## Calera Sponsors OCR Vendor Conclave

In an effort to foster awareness of OCR's benefit to desktop PC users, Calera Recognition Systems is sponsoring a gathering of OCR vendors at spring Comdex. Stephen Hayden, president and CEO of the Santa Clara, California-based company, hopes the meeting will lay the groundwork for a trade alliance between fax board, scanner, and OCR vendors.

"OCR engines have lots of possibilities for use in applications such as text retrieval, document management, and word processing," Hayden said.

Kristy Holch, an industry

Vendors are more willing to negotiate price — especially if you represent a big corporation or have a large budget, said John Snyder, network manager at NCNB National Bank, in Charlotte, North Carolina.

Comdex started out as a dealer show, but corporate buyers have infiltrated the show floor over the years. "We find that about 40 percent of the attendees are corporate buyers, or corporate users checking out the system specs," said John Bryant, product marketing manager for Twinhead Corp. of Milpitas, California.

— Yvonne Lee contributed to this article.

## NCR

Continued From Page 1

\$4,995, the 1-inch-thick system uses a 20-MHz 386SX chip, 2 megabytes of RAM, a monochrome VGA LCD with 640-by-480 resolution, and flash EPROMs. The basic configuration does not include a modem, although the company is investigating various wireless links, sources said.

The 2.9 pounds the 3125 is lighter than the 4.7-pound prototype being demonstrated

by Go Corp. — a critical difference given that both target the same users.

If NCR succeeds in its August delivery, it should open a gap of between six and 12 months over large competitors such as IBM, which is expected to deliver an analogous product in early 1992.

A \$1,500 docking station that gives users access to a 120-megabyte hard disk drive, two expansion slots, and parallel and serial ports will be available.

The rugged design may win points for the company with large users such as United Parcel

Services, whose delivery people often work in extremely hot and cold conditions. UPS is reportedly interested in purchasing 40,000 systems.

"LCDs tend to lose their contrast in lower temperatures, and putting a heater in there would kill batteries," a source said. "Instead NCR makes sure the system chips drive their heat up into the screen to keep it warmer. They have done some clever things with design."

NCR will announce the system June 24, the day before PC Expo opens in New York, sources said.

## QuickMail 2.5 Serves Mixed Company

BY LOUISE PICKEL

CE Software's E-mail package, QuickMail 2.5, will support Macintoshes and PCs running DOS, Windows 3.0, and OS/2 out of the same box, the company announced last week.

Although CE Software has made the client software compatible with Apple Inc.'s System 7, the server and administrator are only compatible with System 6.0.X, said Chris Wallace, product development manager at CE Software. Users will not be able to upgrade their QuickMail servers to System 7, and the company will not predict when compatibility would be available, he said.

Scheduled to ship by the end of next month, QuickMail 2.5 ranges in price from \$199 for a single-user version to \$4,699 for a new 100-user pack. Current users of previous editions can upgrade for \$295 to \$4,699 to upgrade. Other users can upgrade at no cost.

With all the mixing and matching that the new version will allow, users can set up their Macs and PCs on AppleTalk, NetWare 2.86/386, Banyan Viner or LAN Manager networks. Also, users will no longer need a gateway between networked Macs and PCs because the QuickMail Server cares only

about how many mailboxes, rather than what kinds of clients, are connected.

A new feature called QuickMail Configuration Manager allows network administrators to update users' address books, forms, and groups.

The ability to switch back and forth between address books has also been added, said Brad Sharek, CE Software's director of marketing.

A parsing feature that searches on-line news services and sends articles to users is under development.

CE Software, 1801 Industrial Circle, West Des Moines, IA 50265; (515) 224-1995.

## ALSO'S FABLES • BY STEWART ALSOP



## Right Now Digital Is Just Another \$1 Billion Clone Company

Last week, Digital Equipment Corp. introduced a new line of personal computers based on the 80486 processor and designed and manufactured by Intel's own systems group. A lot of stories were written about this event, many of which said it was important because Digital is a really big computer company and, even though it had failed miserably in its previous attempts to get into the personal computer business, it had learned its lesson and was now ready to compete with the major PC companies.

Sphhh! Digital has been a large and important computer company all along, and that hasn't made one whit of difference to the company's role in the personal computer business. The fundamental truth is that Digital has still not accepted personal computers as a key element in computing, nor has it managed to internalize the value of personal computers to the degree that it can become a player in the business. More plainly, Digital Equipment Corp. won't become a player in PCs until founder and CEO Ken Olsen himself learns to like the machines.

Digital has had several efforts under way to participate in the personal computer business. Forget about its failed effort to sell the Rainbow and DEC Professional machines nearly 10 years ago — that's ancient history. The com-

pany's oldest and most successful effort in the personal computer business was to work with the existing personal computer companies to integrate their products with Digital's host computers. The most successful relationships that Digital had in this effort were with Compaq Computer (mostly because both companies have a strong engineering culture and an orientation toward high-performance computing) and with Apple Computer (because both companies have a history of competing with innovation and religious conviction).

Several years ago Digital decided to start selling personal computers under its own label by buying machines from other companies and relabeling them. The first such arrangement the company made was with Tandy Corp. Since then, DEC has added models from Olivetti and now Intel to its product line.

Along with its announcement last week, the company says that it now sells \$1 billion worth of PCs each year, putting it in the top 10 of PC-dom behind IBM, Apple, Compaq, Tandy, and Zenith, but ahead of AST Research and Dell. (One does wonder how such an allegedly large manufacturer could manage to hide such success.)

Most recently, Digital has launched into an effort that it clearly expects to be its path into leadership in desktop computers. That is its membership in the coalition promoting the Advanced Computing Environment (ACE). In this sec-

nario, Digital lets a bunch of other companies adopt its bus, its version of Unix, and a variety of other technologies surrounding the MIPS R4000 processor and, by doing so, defines a new level of functionality for desktop computers that eventually replaces personal computers as the main technology for office computing.

So now you have Digital doing four things: working with PC companies to network their products, relabeling other companies' personal computers, making "low-end" workstations based on Intel processors, and trying to redefine both personal computing and workstations with a new architecture.

Have you noticed a common theme here? In every one of these efforts, Digital has managed to avoid dirtying its hands by actually making mainstream personal computers itself. And this is the problem, because no company — no matter how big or important in the industry at large — can become a leadership company if it is unwilling to engage the mainstream part of the business.

So how could Digital compete effectively? Absolutely the first thing it has to do is decide that it really does want to compete, and that means designing and building a complete product line of personal computers, just as IBM, Apple, and Compaq do. This would include models that sell for \$3,000 as well as hot boxes that sell for \$8,000. That's what I mean by saying that Ken Olsen needs to learn to

like these machines; the company can't compete by standing on the sidelines and nipping away at the margins of hot-box business or the relabeling business or whatever. Nobody likes buying machines from a company that acts as if it is uncomfortable with them.

Then, once it has decided it does want to compete in the mainstream, Digital needs to figure out how to bring something new to the game. The hot box it announced last week contains a hint of that something new: the DECpc 433 Workstation (note that "pc" is lower case and "Workstation" is emphasized) comes with the network adapter built into the machine. That inclusion is typical of workstations, which tend to come with the network adapter as standard equipment.

But DEC hasn't taken the next step that it is required to take, which is to make one operating system standard with the machine and to integrate the networking capabilities into that operating system, so that customers don't have to do their own systems integration. That would be new and valuable, because none of the other clone companies has managed to figure out how to add networking value to its computers. Until then, DEC will just be another \$15 billion clone company.

Stewart Alsop is an industry analyst and editor of PC Letter, in Redwood City, California.

## NOTES FROM THE FIELD • BY ROBERT X. CRINGELY

## IBM OutDOS Itself With New FAT System, Which Has HPFS Sweating

Atlanta, capital of the New South, poster city for global warming, shimmered in the rain as Pammy and I arrived early for Comdex on the red-eye. Then the rain stopped, the sun appeared, and the city began literally to steam, pulling out all its special effects at once for the out-of-towners.

My grandmother, who was raised in Possumtrot, Arkansas, once claimed that the New South was just the Old South with air conditioning, but then she never saw anything as grand as today's Atlanta.

**FAST FAT.** It's all too new. The Olympic stadium is rising next to the World Congress Center. The Atlanta Braves are on top of their division. Can Ted Turner have sold his soul — again?

"Bobby, you don't like anything new." Maybe so, but there's a lot to be said for old reliables, or even old unreliables, sometimes. For example, IBM has put a lot of effort into making Windows and DOS apps run faster under OS/2.2.0 than they do under DOS. And they've succeeded, too, by revamping OS/2's installable FAT file system. I don't know exactly how they've souped it up, but my guess is that it's along the lines of Novell's indecipherable FAT.

Now the new FAT file system is faster than OS/2's real file system, the so-called High Performance File System. So IBM Austin is moving at warp speed — which at Big Blue is measured with a calendar —



to soup up HPFS before OS/2.2.0 ships.

**IT READS 'PAUL IS DEAD.'** Last week I learned that the CIA has standardized on OS/2 on the same day that I read the headline *Gates Nominated to Head CIA*. I'm sure the first thing Bill will do is return the agency to DOS.

Microsoft does seem to be security minded. The holographic DOS 5.0 boxes will also have special ink that shows only under ultraviolet light.

Meanwhile, trying to keep our lives easier for a change, Microsoft and Caseworks (of Atlanta) will announce Tuesday that Microsoft has licensed Caseworks' code generator, which will first appear in Quick C for Windows.

Banyan Systems is ready to license

some of its core technologies, too, including some WAN code and its StreetTalk name service. The first customer will probably be The Santa Cruz Operation.

**OLD DATA NEVER DIES.** Some institutions will never die. For example, Atlanta's topless bars sorta closed back in '88, but like the South have risen again.

Other exposures due next week in Atlanta include Borland showing under nondisclosure its Turbo Xbase for Windows dBase compiler.

Micromin will also roll out a new version of Rbase for OS/2 — still without Presentation Manager support — continuing to throw good money after bad. The original version, in former CEO David Hull's terms, "sold dozens of copies." Also, Micromin's highly touted Vanguard product line is apparently dead.

One database product you won't see at Comdex, however, is Ashton-Tate's PowerStep for the Next machine. Not only is the product on hold, the company is trying to sell its Next systems.

**OOFS.** Georgia comes in a shade of green unknown in California, where brown hills are proudly referred to as *golden*. From the look of the hills, I'd say they are planting rain forests, trying to make up in kudzu for the deforestation of Brazil.

I have some making up of my own to do. Among the many mistakes I made last week, one of them was in this

column. I said that Paperback Software was doing the first GeoWorks spreadsheet. The spreadsheet is actually coming from Dimensions Research, the original developers of VP Planner. Paperback, having barely survived the photon torpedoes of Lotus Development, isn't doing a GeoWorks product.

**SAVE MONEY, EARN SUMMINKUM WAGE.** While I was learning all this, Pammy slept the morning away. She missed the letter from 576 irate Macintosh users, calling for Apple to offer an upgrade so their SE/30, Ilex, and Ixx systems could make full use of System 7. Infinitely generous, Apple wants users to upgrade their systems rather than offer a \$100 ROM swap.

Another bargain: You can get System 7 for free from many BBSes. It takes only 8 hours and 22 minutes of downloading on America On-Line, which costs about \$43 in non-prime time. The mail-order houses will probably sell the real thing for \$59, including docs.

Pammy was up by noon, wearing again the unlined face of a 21 year old. She drew the curtains, threw open the window, and took a deep breath of Georgia humidity. "Okay, I'm ready to go home now," she said.

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